

SONY®

DIGITAL CAMCORDER

DSR-500WS
DSR-500WSP

INDEX PICTURE BOARD

DSBK-301A

ANALOG COMPOSITE INPUT BOARD

DSBK-501
DSBK-501P

SERVICE MANUAL

Volume 1 1st Edition

Power HAD



⚠ 警告

このマニュアルは、サービス専用です。

お客様が、このマニュアルに記載された設置や保守、点検、修理などを行うと感電や火災、人身事故につながる可能性があります。

危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegebenen Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparatillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.

Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

VAROITUS

Paristo voi räjähtää jos se on virheellisesti asennettu.

Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.

Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.

Udskiftning må kun ske med batteri af samme fabrikat og type.

Levér det brugte batteri tilbage til leverandøren.

X-RAY RADIATION WARNING

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

For the customers in the U.S.A. and Canada

RECYCLING NICKEL-CADMIUM BATTERIES

Nickel Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest point for collection, recycling or proper disposal.

Note: In some areas the disposal of nickel cadmium batteries in household or business trash may be prohibited.



RBRC (Rechargeable Battery Recycling Corporation) advises you about spent battery collection by the following phone number.

**Call toll free number: 1-800-822-8837
(United States and Canada only)**

Caution: Do not handle damaged or leaking nickel-cadmium batteries.

Voor de klanten in Nederland

Dit apparaat bevat een $\text{MnO}_2\text{-Li}$ batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg, maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

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MANUAL STRUCTURE

Purpose of this manual

This manual is the Service Manual Vol. 1 of the digital camcorder DSR-500WS/500WSP, the index picture board DSBK-301A and the analog composite input board DSBK-501/501P.

This manual contains the operation manual related to the operations of this equipment, the replacement of the parts and adjustments.

Related manuals

In addition to this Service Manual Vol. 1, the following manuals are provided.

- **Service Manual Vol. 2**

Part No. 9-977-384-21

Contains block diagrams, board layouts, schematic diagrams, semiconductor pin assignments and parts lists.

- **Service Manual DXF-701/701CE/701WS/701WSCE**

Part No. 9-977-265-02

See the DXF-701/701CE/701WS/701WSCE service manual available separately.

- **Service Manual VCT-U14**

Part No. 9-977-221-01

See the VCT-U14 service manual available separately.

- **Service Manual DSR-300/300P**

Part No. 9-977-332-11 (Vol.1)

Part No. 9-977-332-21 (Vol.2)

As for the CA-WR855 camera adaptor, see the DSR-300/300P service manual available separately.

SECTION 1 OPERATING INSTRUCTIONS

This section is extracted
from operation manual.

1-1. DSR-500WS/WSP

3-866-520-11(1)

SONY

SONY

DSR-500WS/500WSP

Digital Camcorder

Operating Instructions

Before operating the unit, please read this manual
thoroughly and retain it for future reference.

Power HAD



DSR-500WS/500WSP

1999 by Sony Corporation

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

Owner's Record

The model and serial numbers are located on the top. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. _____ Serial No. _____

LITHIUM BATTERY

Replace the battery with a Sony CR2032 lithium battery. Use of another battery may present a risk of fire or explosion.

WARNING

Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

Note

Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare ved feilagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

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VARNING

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Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

VAROITUS

Paristo voi räjähtää jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävittä käytetty paristo valmistajan ohjeiden mukaisesti.

For customers in the USA (DSR-500WS only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For customers in Europe (DSR-500WSP only)

This product with the CE marking complies with the EMC Directive (89/336/EEC) issued by the Commission of the European Community.

Compliance with this directive implies conformity to the following European standards:

- EN55103-1: Electromagnetic Interference (Emission)
- EN55103-2: Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following Electromagnetic Environment (s):
E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors) and E4 (controlled EMC environment, ex. TV studio)

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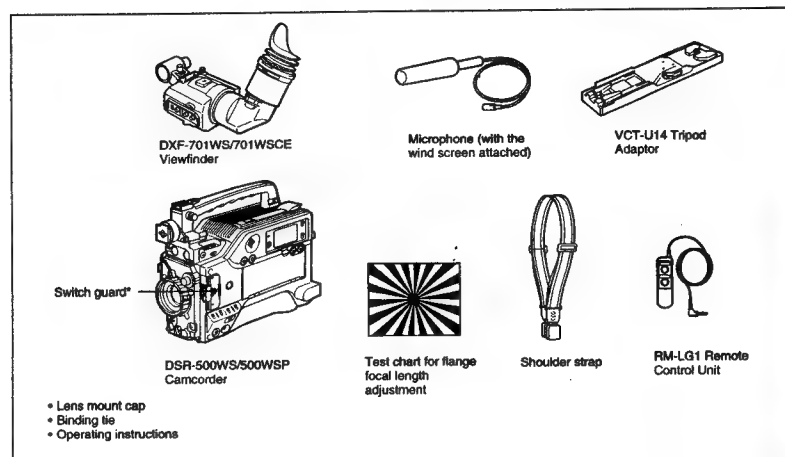
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Product Configurations

The DSR-500WS/500WSP consists of the following items:



* The switch guard can be removed. (See page 12.)

Features

Features on Camera Section

2/3-inch IT type Power HAD WS CCD

The DSR-500WS/500WSP Digital Camcorder uses a newly developed 520,000-pixel Power HAD WS (wide screen) CCD, for outstanding sensitivity and picture quality.

- Sensitivity: F11.0 (at 3200 K, 2000 lux)
- S/N: 63 dB
- Smear: -120 dB

Switchable between 16:9 and 4:3 aspect ratios

A simple menu operation provides instant switching between the 16:9 and 4:3 aspect ratios. In 4:3 mode, a screen equivalent to a 4:3 screen is obtained through digital processing of the 16:9 video signals produced by the WS CCD. (See page 92.)

Wide-aspect ID signals

A menu setting is available to add wide-aspect ID signals¹⁾ to 16:9-mode video signals.²⁾ (See page 92.)

Automatic aspect ratio switching in viewfinder

When the supplied DXF-701WS/701WSCE viewfinder is used, the viewfinder scan size automatically switches in accordance with the aspect ratio (16:9 or 4:3) selected for the camera. (See page 92.)

Sophisticated image processing

TruEye™ processing makes possible the following performance features. This digital signal processing has brought reproduction of natural colors to the level achieved by the human eye.

DynaLatitude™

Enables detailed adjustment of contrast control in each pixel in accordance with a histogram of luminance signal levels. (See pages 50, 81 and 88.)

DCC+ (dynamic contrast control plus)

Prevents white breakup when shooting a high intensity subject, and also prevents color faults in high intensity subject.

Black stretch and compress

Enables control of luminance signal levels in black areas without changing the hue.

Variety of detail corrections

- Skin detail function: this function gives a slightly softer appearance to the subject's face. The target skin color can be automatically set.
- Black halo correction
- Red/green vertical detail correction: this function performs vertical detail compensation for both red and green signals.
- Horizontal detail frequency control

Recording and managing setup data

In addition to the setup menu that is displayed in the viewfinder screen, the DSR-500WS/500WSP is equipped with the following functions to facilitate camcorder setup.

Setup file system

You can use setup files when making adjustments or settings. The DSR-500WS/500WSP comes with factory preset files that contain shipped settings and you can freely create user files as well. (See page 94.)

Automatic recording of setup data (page 99)

SetupLog™: Shooting-related environment settings are recorded onto the tape at intervals of a few seconds. This recorded data can be used to reproduce the same shooting conditions in subsequent shots. It also makes it easier to identify the causes of problems in previous shots.

SetupNavi™: The setup conditions selected with the setup menu and setup files are recorded onto the tape. The recorded setup data can be copied to other camcorders so that the same setup can be shared among several camcorders.

Functions boost operability

Controlling with the RM-VJ1 Remote Control Unit

You can control this unit while watching the image with the optional RM-VJ1 Remote Control Unit (equipped with the microphone and monitor). (See page 41.)

EZ (easy) mode function

When there is no time to check the camcorder settings, simply press the EZ MODE button to start the auto adjustment function using standard settings. There is no need to lose a shot for lack of setup time. (See pages 13, 14, 90 and 91.)

EZ (easy) focus

Press the EZ FOCUS button before shooting to ensure a quick and accurate focus. (See page 13.)

Dual pixel readout (DPR1))

When the gain is set to either 18 dB or 24 dB, the gain setting can be doubled (6 dB up) without increasing the noise level.

Programmable gain

The amount of gain relative to the GAIN switch setting (H, M, or L) can be programmed as -3 dB, 0 dB, 3 dB, 6 dB, 9 dB, 12 dB, 18 dB, 18 dB+DPR, 24 dB, 24 dB+DPR, and hyper gain. (See page 88.)

Hyper gain

Hyper gain (36 dB (=30 dB+DPR), or about 60 times greater than 0 dB) can be easily set via one switch setting. This can also be done from remote equipment. (See pages 21, 22 and 88.)

Auto tracing white balance (ATW)

This function automatically traces the white balance, which constantly changes as lighting conditions change. Auto tracing white balance is especially useful when there is no time to manually adjust the white balance or when shooting moves between indoor and outdoor locations. (See pages 13, 14 and 114.)

Total level control system (TLCS)

Even if the incoming light exceeds the range in which the standard auto iris can control exposure, the auto gain control (AGC) or auto exposure (AE) backs up to ensure proper exposure. (See pages 14 and 90.)

Recording time (REC TIME) display

Recording time can be displayed in either of the following modes. (See pages 21 and 82.)

- Total recording time for all cuts (TTL²⁾)
- Total recording time for current cut (DUR³⁾)

Viewfinder super detail

Video signals for the viewfinder are mixed with DTL signals to make focusing easier.

Dual zebra pattern display

Two types of zebra patterns, zebra 1 and zebra 2 can be displayed simultaneously or independently. The zebra 1 can be set to the levels ranging from 70 to 90 IRE on the DSR-500WS (or from 70 to 90% on the DSR-500WSP) and the zebra 2 indicates the levels of 100 IRE or more for the DSR-500WS (or the levels of 100% or more for the DSR-500WSP). (See pages 13, 14 and 89.)

Color temperature display

When reading the white balance, the color temperature is displayed on the viewfinder screen. (See page 112.)

1) ID signals complying with EIAJ CPR-1204 (DSR-500WS) or complying with ETS WSS (DSR-500WSP).

2) Video signals refer to the following:
 • Video signals output from the VIDEO OUT connector and MONITOR OUT connector.
 • The Y component of Y/C separate signals and the Y component of component signals output from the VTR connector.

1) DPR = Dual Pixel Readout
 2) TTL = Total

3) DUR = Duration

Features

Switching the color temperatures for the preset white balance

You can select the preset white balance at 3200 K or 5600 K by setting the FILTER control. The 3200 K preset can be switched to the 3000 K preset when the menu setting is changed. (See page 88.)

Video monitor output with text

The video signal with text superimposed that is shown in the viewfinder can also be output to an external video monitor. (See pages 19 and 20.)

1-kHz reference signal output

Along with a color bar, a 1-kHz reference signal can also be output. (See page 88.)

Freeze mix function

The freeze mix function superimposes any previously recorded still picture on the viewfinder screen to facilitate framing the subject when reshooting the scene. (See page 60.)

Edit Search Function

Pressing the EDIT SEARCH buttons allows the tape to play back in search mode. Set either of two playback speeds. (See pages 13 and 59.)

Video light control

A video light connector and control switch are equipped. You can turn the light on and off automatically as you start and stop VCR operation. (See page 13.)

High-performance DXF-701WS/701WSCE Viewfinder (page 118)

- Switching the aspect ratio automatically between 16:9 and 4:3
- High resolution (600 TV lines of horizontal resolution)
- Large-diameter eye cup for easier viewing and focusing
- PEAKING potentiometer for vertical and horizontal detail control
- Three indicators can be used as TALLY indicators
- Tough die-cast aluminum body

Features on VCR Section

The DSR-500WS/500WSP uses the DVCAM recording format. The internal signal processing is digitalized to provide more stable output signals and higher reliability.

Compatible with consumer DV

A DV cassette recorded on a DV-format VCR can be played back on the DSR-500WS/500WSP. (Cassettes recorded in LP mode cannot be played back.) (See page 51.)

DVCAM cassettes (page 51)

- The DSR-500WS/500WSP can use both standard-size and mini-size DVCAM cassettes. According to cassette size, the DSR-500WS/500WSP automatically corrects reel position.
- The maximum recording/playback times are 184 minutes for standard size cassettes and 40 minutes for mini cassettes.
- DVCAM cassettes include a cassette memory. Information about the editing points (ClipLink™ log data) that is specified while shooting is recorded into this cassette memory.

Recordable the external video signals

Fitting the optional DSBK-501/501P Analog Composite Input Board enables the camcorder to record the external analog video signals. (See pages 24, 56 and 81.)

ClipLink™ function

The ClipLink function links all stages from shooting to editing. Once editing points have been set with this function during shooting, they can be used to boost the efficiency of editing work. However, this function does not work when using the DV OUT connector. (See pages 68, 109 and 136.)

Creation of clips

Using the ClipLink function, the camcorder operator can create clips to be used during editing. The images captured at the Mark IN points are recorded in a compressed format onto the tape as "Index Pictures." In addition, editing point-related data (scene number, time code for Mark IN/OUT points, etc.) is recorded in the cassette memory.

ClipLink mode

To use the ClipLink function, select the menu setting to set the DSR-500WS/500WSP into ClipLink mode. There is also a ClipLink continue function that enables clips to be continued even after a break in recording.

PCM digital audio

Recording/playback can be set to audio lock mode. Selectable between two-channel recording (with a sampling frequency of 48 kHz) mode or four-channel recording (with a sampling frequency of 32 kHz) mode (CH-1 and CH-2 only). (See pages 16, 17, 55 and 109.)

Equipped with audio output connectors

During recording or playback, audio output can be monitored via a built-in speaker, a connected earphone or via (two-channel) audio output connectors. (See pages 24 and 25.)

Color playback

Connect an external video monitor for color playback (playback adaptor not required). The DSR-500WS/500WSP is equipped with two video monitor connectors: one for composite video output and the other for S-video output. (See page 24.)

VCR data display

The DSR-500WS/500WSP is able to display the following data on the viewfinder screen. (See pages 76, 89 and 90.)

- Time values (counter, time code, or user bit values)
- Audio recording levels
- Remaining tape time
- Operation mode of the VCR section
- Remaining battery capacity
- ClipLink information

Recording on external VCRs

Betacam or S-VHS VCRs can be connected to the VTR connector (26-pin) on the rear panel. (See pages 25, 26, 45 and 56.)

Equipped with the DV OUT connector

The DV OUT connector is i.LINK¹⁾ compatible. You can connect with the Sony equipment which has the DV input connector. You can do cut editing and digital dubbing if you connect the DSR-70/70P Digital Videocassette Recorder (with the DSBK-140 is fitted) to the DV OUT connector on the camcorder, using an i.LINK cable (DV connecting cable). (See pages 25, 26, 45 and 57.)

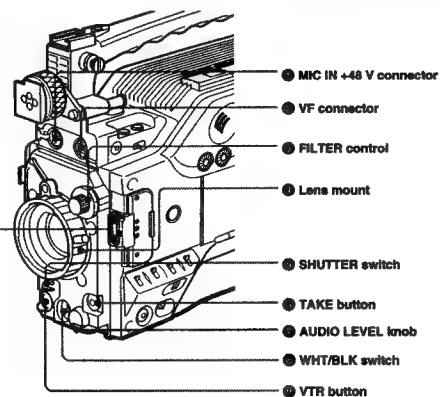
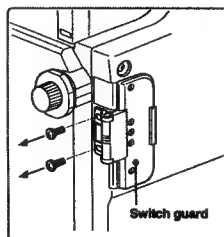
1) i.LINK is a trademark of Sony Corporation and indicates that this product is in agreement with IEEE 1394-1995 specifications and their revisions.

Location and Function of Parts

Front View

● Switch guard

How to remove the switch guard
 1. Detach the two screws (M3).
 2. Remove the switch guard, and replace the screws detached in step 1.



① MIC (microphone) IN +48 V connector (XLR 3-pin, female)
 Connect the supplied microphone or an optional microphone (operable with a 48 V supply).

② VF (viewfinder) connector (20-pin)
 This is the connector for the DXF-701WS/701WSCE viewfinder.

③ FILTER control
 Select the color temperature conversion filter appropriate to the lighting conditions. (See page 49.)

④ Lens mount
 Attach the optional zoom lens here.

⑤ SHUTTER switch
 Use this switch to set the shutter speed, CLS (clear scan), or EVS setting (see page 116). Usually, set this switch to OFF.

⑥ TAKE button
 Press this button to specify an editing point (Mark IN/OUT or Cue point) at the current tape position during shooting. (See pages 70 and 71.)

⑦ AUDIO LEVEL knob
 You can use this knob to manually adjust the channel 1 audio recording level.

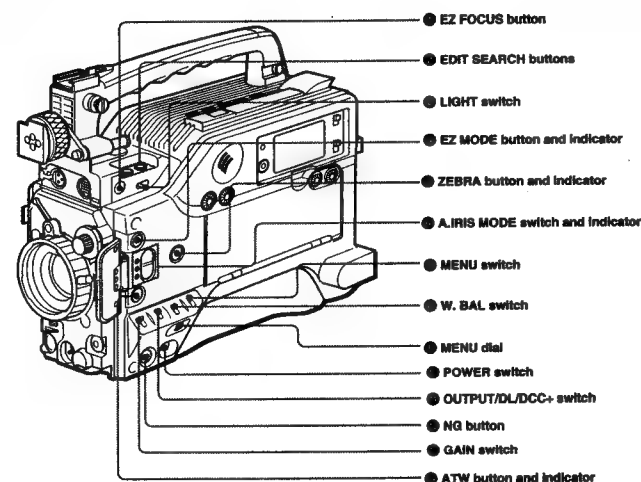
⑧ WHT/BLK (white/black) switch
 This switch is used for automatic adjustment of the white balance and black balance. (See pages 112 to 115.)

⑨ VTR button
 Pressing this button starts and stops recording on the VCR.

⑩ Switch guard
 Avoids miss-operation of the EZ MODE button (⑪ on page 14), A.IRIS MODE switch (⑫ on page 14), and ATW button (⑬ on page 14). When using these buttons and switch, open the guard.

Right Side View

Front section



① EZ FOCUS button
 Press this button to turn the "easy focus" function on. This opens the iris, to make it easier to focus before beginning shooting. The indication "EZ FOCUS" appears in the viewfinder while the function is on; to turn it off, press the EZ FOCUS button again. If left on, the function automatically turns off after about ten seconds.

Note

If the "easy focus" function is still on when you press the VTR button on the camcorder or the lens, it turns off automatically and recording starts about one second later.

② EDIT SEARCH buttons
 You can see the search playback while pressing either of these buttons at recording pause mode to quickly find the next recording start point. Two playback speeds are available, and press either of the buttons to the inner position to increase the speed.

③ LIGHT (video light) switch
 Controls the video light connected as follows.
AUTO: turns on the video light at recording if the power switch on the light is set on.
MAN (manual): allows the power switch on the video light to turn the light on and off.

Location and Function of Parts

④ EZ ("easy") MODE button and indicator

Press this button (EZ mode on) when you want to be able to shoot immediately, with automatic adjustment of the camcorder settings to standard values. (See page 91 for EZ mode settings.) When this function is used, the iris and the white balance are adjusted automatically. (The total level control system functions.) Press this button again to return the camcorder to the previous settings (EZ mode off).

Note

When the RM-M7G Remote Control Unit is connected or external analog signals are input, the "easy mode" function is disabled.

⑤ ZEBRA button and indicator

Depress this button to display a zebra pattern (diagonal stripes) in the viewfinder.

Depending on the zebra setting in advanced menu page 4 (see page 89), the zebra 1 for video levels between 70 to 90 IRE (or 70 to 90%) and the zebra 2 for video levels 100 IRE or more (or 100% or more) can be displayed independently or simultaneously.

⑥ A.IRIS (auto iris) MODE switch and indicator

When you use the auto iris function (by setting the IRIS selector on the lens to A), set this switch to suit the shooting conditions. Selecting BACK L gives more light to back-lit subjects, and selecting SPOT L adjusts for high contrast in spot-lit subjects. For normal shooting, set this switch to STD.

⑦ MENU switch

When you press this switch to the ON position, the basic menu is displayed. Keep pressing it to the ON position to cycle through the various menu displays. When you press the switch to the STATUS position, the camcorder's status (of current settings) is displayed.

⑧ W. BAL (white balance) switch

This selects the white balance setting from the preset value, the value in memory A or the value in memory B. (See page 113.) You can select the preset white balance at 3200 K or 5600 K using the FILTER control (④ on page 12). If you select the 3200 K preset, it can be switched to the 3000 K preset in advanced menu page 3 (see page 88).

⑨ MENU dial

Use this dial to change menu pages or settings.

⑩ POWER switch

Powers the camcorder on or off.

⑪ OUTPUT/DL/DCC+ (Color bar output/dynaLatitude/dynamic contrast control plus) switch

Use this switch to select the DCC+ function, the DynaLatitude function, or color bar output.

Select the CAM/DCC+ position in most cases.

CAM/DCC+: This activates the DCC+ function. This prevents color faults when shooting high-intensity subjects.

CAM/DL: This setting uses the DynaLatitude function, which finely adjusts the contrast of each pixel according to a histogram of luminance signal levels. Access advanced menu page 2 to set the DynaLatitude function ON or OFF. The DynaLatitude effect can be set to any of three levels, Low, STD (standard), and High with basic menu page 2.

BARS: This setting displays color bars.

For details of menu operation, see Chapter 4 "Viewfinder Screen Indications and Menus".

⑫ NG button

When using the ClipLink function during shooting, you can designate a particular scene as "NG" (No Good) by pressing this button before shooting the next scene. Press the button again to cancel the NG setting.

⑬ GAIN switch

This selects one of the three gain settings, high, medium or low. You can choose the gain values assigned to the H, M and L settings from values from -3 dB to 24 dB + DPR, and hyper gain. (See page 88.) The factory default selections are 18 dB (H), 9 dB (M) and 0 dB (L).

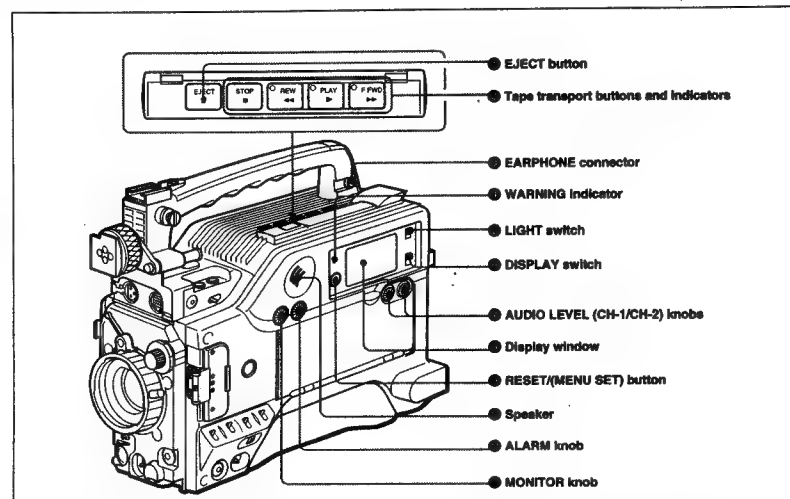
Note

When the HYPER GAIN switch (⑦ on page 22) is in the ON position, the GAIN switch has no effect.

⑭ ATW (auto tracing white balance) button and indicator

Press this button, turning the indicator on, when you want the white balance to be adjusted automatically to follow changes in lighting conditions. (See page 114.)

Rear section



① EJECT button

Press to open the cassette holder (① on page 24) when the camcorder is powered.

② Tape transport buttons and indicators

These buttons transport the tape as shown below.

Buttons	Operation
REW ◀	Rewinds the tape. The indicator lights while the tape is being rewound. Press while the tape is being rewound or during playback to view reverse search playback.
F FWD ▶▶	Fast forwards the tape. The indicator lights while the tape is being fast forwarded. Press while the tape is being fast forwarded or during playback to view forward search playback.
PLAY ▶	Plays back the recorded video. The indicator lights during playback.
STOP ■	Stops the tape.

Note

During recording, none of these buttons operates.

③ EARPHONE connector (mini-jack)

Connect an earphone or headphones. This outputs the sound which was output to the speaker (⑩ on page 18), but mutes the speaker.

④ WARNING indicator

This lights or blinks when an abnormality occurs.

For details, see "Warning System" on page 127.

⑤ LIGHT switch

This switches the display window (⑥ on page 16) light on or off.

⑥ DISPLAY switch

Switches time value indication shown in the display window (⑥ on page 16).

COUNTER: Shows the tape transport time in

HH:MM:SS (hours, minutes and seconds).

TC: Shows the time code value.

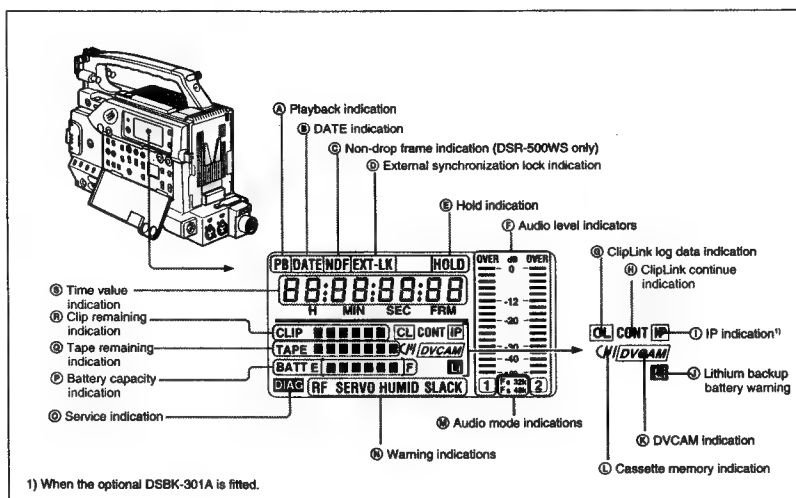
U-BIT: Shows the user bit data in the time code.

Location and Function of Parts

7 AUDIO LEVEL (CH-1/CH-2) (audio recording level adjustments for channels 1 and 2) knobs
When the AUDIO SELECT (CH-1/CH-2) switches (4 on page 20) are set to MAN, these knobs adjust the audio levels being recorded on channels 1 and 2.

The audio levels are indicated in the display window 8. For details, see "8 Display window" below.

8 Display window
Shows the following items. Use the LIGHT switch (6 on page 15) to light up the display window.



Indications in the display window

Indication	Description
4 Playback indication	Appears during playback, fast forward or rewind with the time data display showing a time code or user bit value.
6 DATE indication	Appears when the date or time is displayed in the time value indication 5 area.
5 Non drop-frame indication (DSR-500WS only)	Appears when non-drop frame mode is selected.
5 External synchronization indication	Appears when the internal time code generator is locked to an external signal input to the TC IN connector (5 on page 24).
6 Hold indication	Appears when the internal time code generator is stopped.
7 Audio level indicators	These show the audio recording or playback levels of channel 1 and channel 2.
8 ClipLink log data indication	Appears when using a cassette with cassette memory containing ClipLink log data.
8 ClipLink continue indication	Appears when back space editing using ClipLink function is possible.
1 IP (Index Picture) indication	Appears when the ClipLink function is set to on in the VCR menu and Index Picture recording is allowed. (The optional DSBK-301A is required.)

Indication	Description																													
④ Lithium backup battery warning	Appears when the voltage of the internal lithium backup battery (CR2032) is low. If this indication appears, replace the lithium backup battery immediately. For further information about replacing lithium battery, see "Inserting and Replacing the Lithium Battery" (page 31).																													
Ⓚ DVCAM indication	Disappears when the cassette being played back is not for DVCAM format.																													
Ⓒ Cassette memory indication	Appears when using a cassette with cassette memory.																													
Ⓐ Audio mode indications	These show audio recording/playback mode. Fs32k: 4-channel mode (32kHz sampling frequency) Fs48k: 2-channel mode (48kHz sampling frequency) For further information about selecting audio recording mode, see "Menu 212 Selecting Audio Recording Mode" (page 109).																													
Ⓜ Warning indications	Include the following. RF: Appears when the video heads are clogged, or when there is a fault in the recording system. SERVO: Appears when the servo lock is not functioning. HUMID: Appears when there is condensation on the drum. SLACK: Appears when there is a tape winding fault. For measures against warning indications, see "Warning System" (page 127).																													
Ⓢ Service indication	Appears during maintenance or VCR menu operations (page 103). It does not appear during normal operation.																													
Ⓟ Battery capacity indication	This indicates the battery capacity and voltage as shown below. Change menu setting for the battery you are using. For menu settings, see "Menu 206 Selecting Battery Capacity Indication" (page 106). <table><tr><th rowspan="2">Indication</th><th colspan="2">Battery voltage</th></tr><tr><th>BP-L40/L60/L60A/ L90/L90A</th><th>NP-1B/BP-90A</th></tr><tr><td>BATT E[■■■■■■■]F</td><td>15.0 V or more</td><td>12.5 V or more</td></tr><tr><td>BATT E[■■■■■■] F</td><td>14.0 to 15.0 V</td><td>12.0 to 12.5 V</td></tr><tr><td>BATT E[■■■■■] F</td><td>13.0 to 14.0 V</td><td>11.75 to 12.0 V</td></tr><tr><td>BATT E[■■■■] F</td><td>12.0 to 13.0 V</td><td>11.5 to 11.75 V</td></tr><tr><td>BATT E[■■■] F</td><td>11.3 to 12.0 V</td><td>11.3 to 11.5 V</td></tr><tr><td>BATT E[■■■] F (blinking)¹⁾</td><td>11.25 to 11.3 V</td><td>11.25 to 11.3 V</td></tr><tr><td>BATT E[■■] F (blinking)</td><td>11.0 to 11.25 V</td><td>11.0 to 11.25 V</td></tr><tr><td>BATT E[■] F (blinking)</td><td>11.0 V or less</td><td>11.0 V or less</td></tr></table>	Indication	Battery voltage		BP-L40/L60/L60A/ L90/L90A	NP-1B/BP-90A	BATT E[■■■■■■■]F	15.0 V or more	12.5 V or more	BATT E[■■■■■■] F	14.0 to 15.0 V	12.0 to 12.5 V	BATT E[■■■■■] F	13.0 to 14.0 V	11.75 to 12.0 V	BATT E[■■■■] F	12.0 to 13.0 V	11.5 to 11.75 V	BATT E[■■■] F	11.3 to 12.0 V	11.3 to 11.5 V	BATT E[■■■] F (blinking) ¹⁾	11.25 to 11.3 V	11.25 to 11.3 V	BATT E[■■] F (blinking)	11.0 to 11.25 V	11.0 to 11.25 V	BATT E[■] F (blinking)	11.0 V or less	11.0 V or less
Indication	Battery voltage																													
	BP-L40/L60/L60A/ L90/L90A	NP-1B/BP-90A																												
BATT E[■■■■■■■]F	15.0 V or more	12.5 V or more																												
BATT E[■■■■■■] F	14.0 to 15.0 V	12.0 to 12.5 V																												
BATT E[■■■■■] F	13.0 to 14.0 V	11.75 to 12.0 V																												
BATT E[■■■■] F	12.0 to 13.0 V	11.5 to 11.75 V																												
BATT E[■■■] F	11.3 to 12.0 V	11.3 to 11.5 V																												
BATT E[■■■] F (blinking) ¹⁾	11.25 to 11.3 V	11.25 to 11.3 V																												
BATT E[■■] F (blinking)	11.0 to 11.25 V	11.0 to 11.25 V																												
BATT E[■] F (blinking)	11.0 V or less	11.0 V or less																												

1)Replace the battery pack when this indication appears.

1) Replace the battery pack when this indication appears.

(Continued)

Location and Function of Parts

Indication	Description																														
⑩ Tape remaining indication	<p>During recording or pause mode, this indication shows the remaining tape time as shown below. It is not displayed when no cassette is loaded.</p> <table><tr><th>Indication</th><th>Tape time remaining</th></tr><tr><td>TAPE■■■■■■■</td><td>30 minutes or more</td></tr><tr><td>TAPE■■■■■■■</td><td>25 to 30 minutes</td></tr><tr><td>TAPE■■■■■■■</td><td>20 to 25 minutes</td></tr><tr><td>TAPE■■■■■</td><td>15 to 20 minutes</td></tr><tr><td>TAPE■■■■</td><td>10 to 15 minutes</td></tr><tr><td>TAPE■■■</td><td>5 to 10 minutes</td></tr><tr><td>TAPE■</td><td>2 to 5 minutes</td></tr><tr><td>TAPE■ (blinking)</td><td>0 to 2 minutes</td></tr><tr><td>TAPE (blinking)</td><td>End of tape</td></tr></table>	Indication	Tape time remaining	TAPE■■■■■■■	30 minutes or more	TAPE■■■■■■■	25 to 30 minutes	TAPE■■■■■■■	20 to 25 minutes	TAPE■■■■■	15 to 20 minutes	TAPE■■■■	10 to 15 minutes	TAPE■■■	5 to 10 minutes	TAPE■	2 to 5 minutes	TAPE■ (blinking)	0 to 2 minutes	TAPE (blinking)	End of tape										
Indication	Tape time remaining																														
TAPE■■■■■■■	30 minutes or more																														
TAPE■■■■■■■	25 to 30 minutes																														
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TAPE■■■■	10 to 15 minutes																														
TAPE■■■	5 to 10 minutes																														
TAPE■	2 to 5 minutes																														
TAPE■ (blinking)	0 to 2 minutes																														
TAPE (blinking)	End of tape																														
⑪ Clip remaining indication	<p>This shows how many clip shots or Cue points can be recorded¹⁾.</p> <table><tr><th>Indication</th><th>Clip shots</th><th>Cue point</th></tr><tr><td>CLIP■■■■■■■</td><td>51 or more</td><td>101 points or more</td></tr><tr><td>CLIP■■■■■■■</td><td>41 to 50</td><td>81 to 100 points</td></tr><tr><td>CLIP■■■■■</td><td>31 to 40</td><td>61 to 80 points</td></tr><tr><td>CLIP■■■■</td><td>21 to 30</td><td>41 to 60 points</td></tr><tr><td>CLIP■■■</td><td>11 to 20</td><td>21 to 40 points</td></tr><tr><td>CLIP■</td><td>1 to 10</td><td>1 to 20 points</td></tr><tr><td>CLIP■ (blinking) ²⁾</td><td>1 to 3</td><td>1 to 6 points</td></tr><tr><td>CLIP</td><td>Cannot record</td><td></td></tr><tr><td>CLIP (blinking) ²⁾</td><td>Cannot record</td><td></td></tr></table> <p>1) The optional DSBK-301A is required for Index Picture recording. 2) When back space editing using ClipLink function is possible (when CONT is displayed).</p>	Indication	Clip shots	Cue point	CLIP■■■■■■■	51 or more	101 points or more	CLIP■■■■■■■	41 to 50	81 to 100 points	CLIP■■■■■	31 to 40	61 to 80 points	CLIP■■■■	21 to 30	41 to 60 points	CLIP■■■	11 to 20	21 to 40 points	CLIP■	1 to 10	1 to 20 points	CLIP■ (blinking) ²⁾	1 to 3	1 to 6 points	CLIP	Cannot record		CLIP (blinking) ²⁾	Cannot record	
Indication	Clip shots	Cue point																													
CLIP■■■■■■■	51 or more	101 points or more																													
CLIP■■■■■■■	41 to 50	81 to 100 points																													
CLIP■■■■■	31 to 40	61 to 80 points																													
CLIP■■■■	21 to 30	41 to 60 points																													
CLIP■■■	11 to 20	21 to 40 points																													
CLIP■	1 to 10	1 to 20 points																													
CLIP■ (blinking) ²⁾	1 to 3	1 to 6 points																													
CLIP	Cannot record																														
CLIP (blinking) ²⁾	Cannot record																														
⑫ Time value indication	<p>Depending on the DISPLAY switch (⑤ on page 15) setting, this shows a counter value, time code value or user bit value. Press the MENU button (① on page 19) to display the VCR menu.</p>																														

⑬ RESET/(MENU SET) (counter reset/VCR menu) button

Resets the time value shown in the display window. This button operates differently depending on settings of the DISPLAY switch (⑤ on page 15), and the TC mode switches 1 (④ on page 20) and 2 (④ on page 20).

Switch setting	RESET button operation
DISPLAY: COUNTER	Resets counter value to 0:00:00.
DISPLAY: TC TC mode switch 1: PRESET TC mode switch 2: SET	Resets time code to 00:00:00:00.
DISPLAY: U-BIT TC mode switch 1: PRESET TC mode switch 2: SET	Resets user bit ^{a)} to 00 00 00 00.

a) Bits of time code recorded on tape, in which users can record necessary information.

Also, this button is used to change VCR menu settings.

For details on the VCR menu, see "Setting on the VCR Section —VCR Menu" (page 103).

⑭ Speaker

Outputs the recorded or playback audio. When a warning indicator appears in the viewfinder or display window, the speaker sounds a warning tone. The speaker is muted (does not output a warning tone) when an earphone is connected to the EARPHONE connector (④ on page 15).

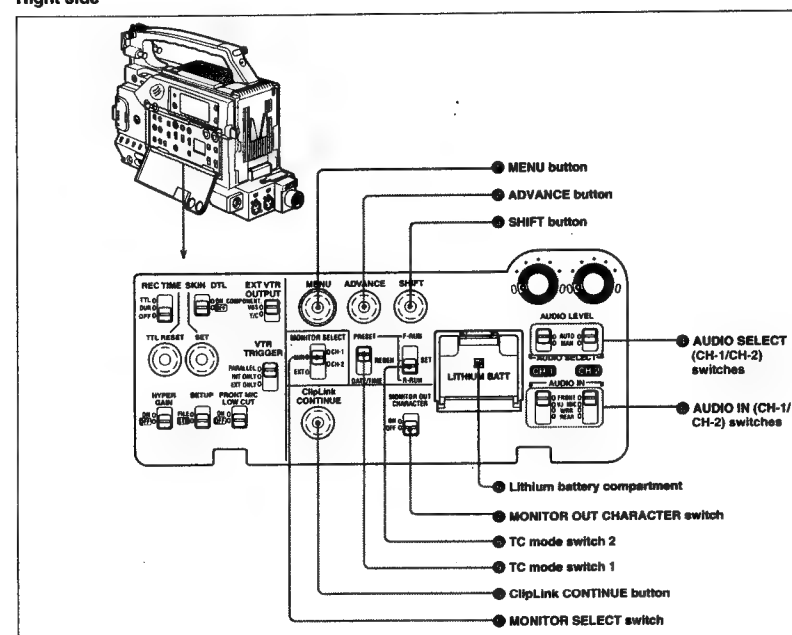
For details on the warning tone, see "Warning System" (page 127).

⑮ ALARM (alarm tone volume adjustment) knob
Controls the volume of the warning tone that is output via the speaker (⑭ on page 18) or the EARPHONE connector (④ on page 15). Turning this knob to the minimum setting mutes the alarm tone.

⑯ MONITOR (monitor volume adjustment) knob
Controls the volume of the sound other than the warning tone that is output via the speaker (⑭ on page 18) or the EARPHONE connector (④ on page 15). Turning this knob to the minimum setting mutes the audio output.

Operation panel under the cover

Right side



① MENU button

Press this button to display the VCR menu in the display window.

For details about the VCR menu, see "Setting on the VCR Section —VCR Menu" (page 103).

② ADVANCE button

When setting time code and user bit values, or at menu setting, press this button to increment the digit that has

been selected with the SHIFT button (③ on page 20). In other case, keep pressing this button to show the clip remaining indication instead of time value. (Example: CLIP 045)

For time code and user bit settings, see pages 62 to 65.

On how to use the ADVANCE button for menu settings, see "Setting on the VCR Section —VCR Menu" (page 103).

21

Location and Function of Parts

Note

The recording time displayed when this switch is set to TTL or DUR is obtained by counting the duration of the internal reference signal input to the camcorder. The value may not agree exactly with the value derived from the time code values. Furthermore, the value displayed may not be correct when another manufacture's VCR is connected to the camcorder.

② SKIN DTL (skin detail) switch

Set this switch ON to use the skin detail correction function.

For details, see "Skin Detail Correction" (page 123).

③ EXT VTR OUTPUT switch

Depending on the external VCR connected to the VTR connector (⑩ on page 26), this switches the video signal output to the VCR.

COMPONENT/VBS: Component/composite video signal

Y/C: S-video signal

④ VTR TRIGGER switch

Sets the function of the VTR button on the camcorder or lens when a VCR is connected to the VTR connector (⑩ on page 26).

PARALLEL: Operates both internal and external VCRs.

INT ONLY: Operates the internal VCR only.

External VCR operation is performed locally.

EXT ONLY: Operates the external VCR only.

⑤ FRONT MIC LOW CUT switch

Set this switch to ON to insert a high-pass filter in the microphone circuit, reducing wind noise. Normally leave the switch in the OFF position.

⑥ SETUP switch

Use this switch to select the camcorder setup method.

FILE: Set up using setup files and the setup menu.

STD: Set up using the setup menu. Setup file data is not displayed.

⑦ HYPER GAIN switch

Setting this switch to ON increases the gain by a factor of about 60 times with respect to 0 dB (a 30 dB increase by electronic amplification and a 6 dB increase for DPR, bringing about a total gain increase of 36 dB).

When this switch is in ON position, the indication "HYPER" appears in the viewfinder, and the GAIN UP indicator in the viewfinder also lights.

When finished shooting, return this switch to OFF position. The HYPER indication disappears and the GAIN UP indicator goes out.

Note

Increasing the gain with this switch reduces the horizontal resolution by approx. 50%.

⑧ SKIN DTL (skin detail) SET button

Press this button with the SKIN DTL switch ② has been set to ON to display the area detect cursor on viewfinder screen. Place the cursor on the target and press this button to perform skin detail correction.

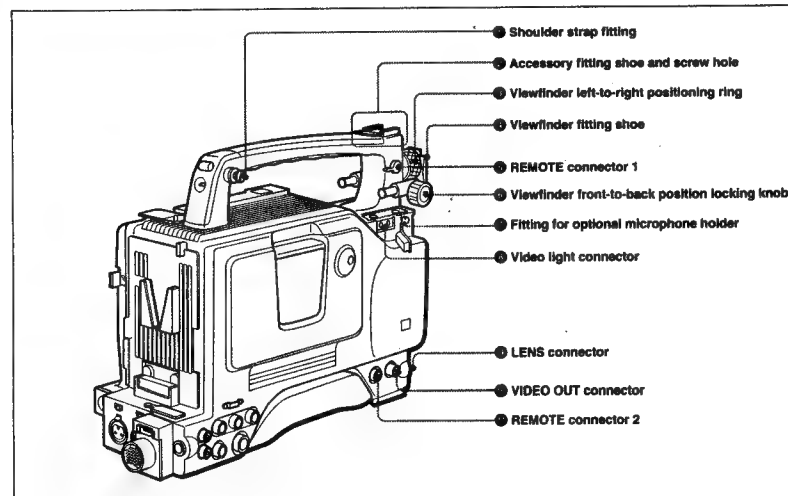
For details, see "Skin Detail Correction" (page 123).

⑨ TTL (total) RESET button

Pressing this button resets the total recording time (TTL selection) to 0.

Left and Upper View

Front section



① Shoulder strap fitting

To use the supplied shoulder strap, fix one end here and the other end to the right side. (See page 38.)

② Accessory fitting shoe and screw hole

Attach optional video lights or other accessories here. (See page 37.)

③ Viewfinder left-to-right position fixing ring

Loosen this ring to adjust the left-to-right position of the viewfinder. (See page 34.)

④ Viewfinder fitting shoe

Fix the DXF-701WS/701WSCE Viewfinder here. (See page 34.)

⑤ REMOTE connector 1 (mini-jack)

Connect the RM-LG1 Remote Control Unit to enable remote operation of the ClipLink function. If you connect the optional cable (Sony part number: 1-790-779-11) to this connector, you can control the

zoom using the optional RM-VJ1 Remote Control Unit (equipped with microphone and monitor), even if you use the conventional lens.

For details, consult your Sony dealer.

Note

The RM-81 cannot be connected.

⑥ Viewfinder front-to-back position locking knob

Loosen this knob to adjust the front-to-back position of the viewfinder. (See page 34.)

⑦ Fitting for optional microphone holder

You can fit an optional CAC-12 Microphone Holder here. (See page 36.)

⑧ Video light connector

A video light with a maximum power consumption of 30 W such as the Anton Bauer Ultralight 2 or equivalent can be connected. (See page 37.)

Location and Function of Parts

⑨ LENS connector (12-pin)

Connect the lens cable.

⑩ VIDEO OUT connector (BNC)

This outputs the video signal captured by the camcorder.

⑪ REMOTE connector 2 (10-pin)

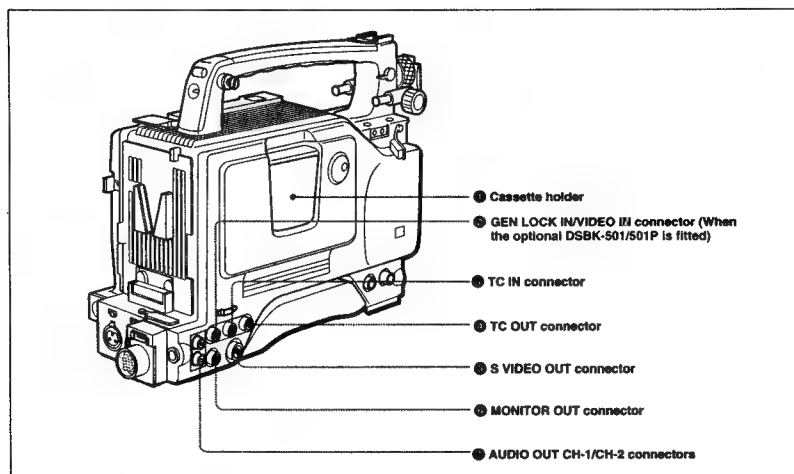
Connect the optional RM-M7G Remote Control Unit to this connector. Set the CAMERA SELECT switch on the bottom of RM-M7G to I.

You can also connect the RM-VJ1 Remote Control Unit (equipped with microphone and monitor.)

Notes

- EZ mode cannot be used if the RM-M7G is connected to the camcorder.
- Be sure to turn off the power of the camcorder before connecting the RM-M7G/VJ1.
- Be sure to turn off the power of the camcorder before disconnecting the equipment connected to this connector. Otherwise, the camcorder will not work properly.

Rear section



① Cassette holder

Power the camcorder and press the EJECT button to open the lid. Insert the cassette and close the lid by pressing the indication "PUSH".

② GEN LOCK IN (gen lock video input)/VIDEO IN (video input) connector (When the optional DSBK-501/501P is fitted) (BNC)

GEN LOCK IN: When synchronizing the camcorder to an external signal, input a reference video signal (VBS or BS). (See page 81.)

VIDEO IN: When the optional DSBK-501/501P Analog Composite Input Board is fitted to the camcorder, you can input the analog video signals (VBS) to this connector.

③ TC IN (time code input) connector (BNC)

Input an external signal for synchronizing the built-in time code generator. Use an SMPTE (DSR-500WS) or EBU (DSR-500WSP) time code signal.

Note

Use a jitterless LTC signal. Using an LTC signal reproduced by other equipment may cause the camcorder to malfunction.

④ TC OUT (time code output) connector (BNC)

This outputs time code signals from the built-in time code generator. When a time code signal is input to the TC IN connector (③ on page 24), this output signal is synchronized to it.

For details about time code, see "Setting Time Values" on page 62.

⑤ S VIDEO OUT (S-video output) connector (DIN 4-pin)

This outputs the image being shot or played back as S-video signals. Connect to the S-video input connector

on an external VCR or video monitor.

⑥ MONITOR OUT (output) connector

Outputs the image being shot or played back as composite video signals. Connect to the video input connector on an external VCR or video monitor.

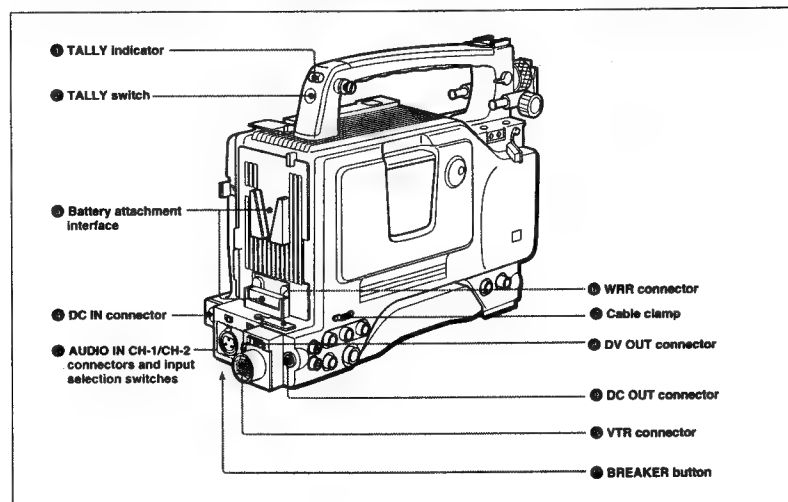
Note

The output signal from this connector may discontinue when switching the operation between recording and playback. Do not use as a reference video signal for external equipment.

⑦ AUDIO OUT CH-1/CH-2 (audio output channel 1 and 2) connectors (phono jacks)

These output the sound being recorded or played back. Connect to a stereo amplifier or video monitor's audio input connectors.

Rear and Bottom



① TALLY (back tally) indicator (red)

This indicator lights during recording. It will not light if the TALLY switch ② is set to OFF. This indicator also blinks to indicate warnings in the same manner as the REC/TALLY indicator in the viewfinder.

② TALLY switch

Set this switch to ON to activate the TALLY indicator ① function.

For details, see "Warning System" on page 127.

Location and Function of Parts

⑤ Battery attachment interface

Attach a battery pack or an AC-DN1/DN2A, AC Adaptor. When using the WRR-855A synthesized tuner (for wireless microphones), attach the CA-WR855 Camera Adaptor here.

For information about fitting a battery pack or an AC adaptor, see "Power Supply" (page 46). For information about attaching a synthesized tuner, see "Connecting to Audio System" (page 39).

④ DC IN (DC power input) connector (XLR 4-pin, male)

To use the camcorder with an AC power supply, connect an optional AC-550/550CE or CMA-8A/8ACE AC Adaptor.

⑤ AUDIO IN CH-1/CH-2 (audio input channel 1 and 2) connectors (XLR 3-pin, female) and input selection switches

Connect a microphone or other external audio equipment. Set the input selection switches as shown below according to the microphone or equipment.

MIC+48V ON (right position): For connecting to a 48-V microphone

Note

If this position is selected for a microphone other than 48-V microphone, the microphone may be damaged.

MIC (center position): For connecting any microphone other than 48-V microphone

LINE (left position): For connecting an external audio signal source such as a stereo amplifier.

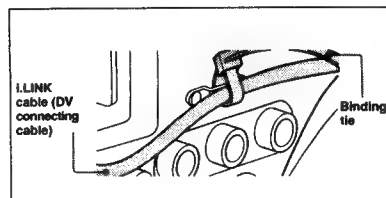
⑥ WRR (synthesized tuner) connector (7-pin)

Insert the WRR-855A synthesized tuner into the CA-WR855 Camera Adaptor and connect the CA-WR855 here.

For information about attaching a synthesized tuner, see "Connecting to Audio System" (page 39)

⑦ Cable clamp

Fasten an i.LINK cable (DV connecting cable) to the clamp using the supplied binding tie so that the plug is not pulled out.



⑧ DV OUT connector (6-pin)

Connect to the DV input connector of an external VCR.

Notes

- This connector will not work as an input connector.
- When an external equipment, such as VCR, is connected to this connector, the ClipLink and the audio fade-in/fade-out function during recording will not work.

⑨ DC OUT (DC power output) connector (4-pin, female)

This connector supplies power for a WRR-810A/860A UHF Portable Tuner.

⑩ VTR connector (26-pin, male)

Connect an external VCR.

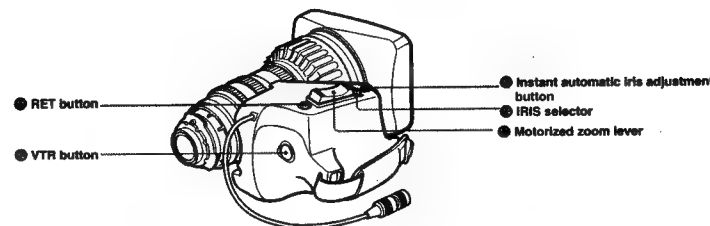
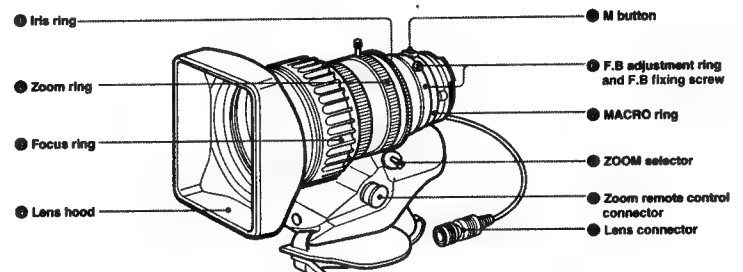
Notes

- This connector always outputs the signals from the camera. It is impossible to output the playback video of the internal VCR.
- A camera control unit (CCU) cannot be connected to this connector.
- The image size on the viewfinder or on the screen of the RM-VJ1 will not switched automatically, even if the aspect ratio (16:9/4:3) of the return signal, input from an external VCR, is switched.

⑪ BREAKER (breaker reset) button

If an excessive current flows in the internal circuits, the internal circuit breaker shuts off the power supply. Push this button after eliminating the cause of the excessive current.

VCL-918BY Zoom Lens (not supplied)



Location and Function of Parts

① Iris ring

For manual iris control, set the IRIS selector to the "M" position, and turn this ring.

② Zoom ring

For direct manual zoom control, set the ZOOM selector to the "MANU." position, and turn this ring.

③ Focus ring

Turn this ring to focus the lens on the subject.

④ Lens hood

⑤ M (close-up) button

For close-up work, turn the MACRO ring while holding this button down. (See page 121.)

⑥ F.B (flange focal length) adjustment ring and F.B (flange focal length) fixing knob

F.B (flange focal length) adjustment ring : To adjust the flange focal length, loosen the F.B fixing knob, then turn the ring. (See page 119.)
F.B (flange focal length) fixing knob: Fixes the F.B adjustment ring.

⑦ MACRO (close-up) ring

For close-up, turn this ring while holding the M button down. (See page 121.)

⑧ ZOOM selector

This selects the mode of zoom operation.

SERVO: power zoom

MANU. (manual): manual zoom

⑨ Zoom remote control connector (8-pin)

Connect the optional LO-26 lens remote control unit for remote control of zooming.

When connecting the optional lens cable (Sony product number: 1-790-779-11) to this connector, you can control the zoom from the RM-VJ1 Remote Control Unit (equipped with microphone and monitor). (See page 41.)

⑩ Lens connector (12-pin)

Connect to the LENS connector (⑩ on page 24) of the camcorder.

⑪ RET (return) button

This allows you to check the video signal as follows. When the internal VCR is in recording pause mode, press this button to review the last few seconds of the recording in the viewfinder (recording review). When an external VCR is connected, pressing this button connects the E-E video signal¹⁾ from the external VCR to the viewfinder while the internal VCR is recording or no tape is inserted in the internal VCR.

For details, see "Playback — Checking Recorded Contents" (page 61).

⑫ VTR button

This button starts and stops recording on the VCR. Press it once to start recording, and once more to stop.

⑬ Instant automatic iris adjustment button

While using manual iris control, press this button to switch temporarily to the automatic iris control setting. The automatic setting is maintained as long as you hold the button down.

⑭ IRIS selector

This selects the mode of iris operation. (See page 14.)

A (automatic): automatic iris

M (manual): manual iris

⑮ Motorized zoom lever

Use this to carry out a power zoom. Pressing the lever harder increases the zoom speed.

W end: zoom toward wide angle

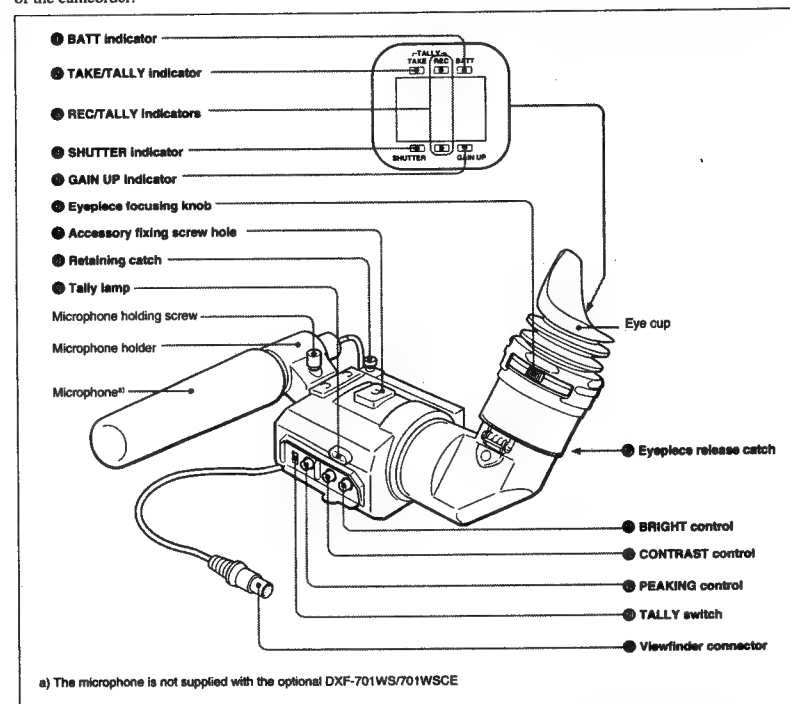
T end: zoom toward telephoto

1) **E-E video signal:** "electric-to-electric" video signal.

This is the input video signal which has passed through internal electrical circuits, but has not been converted to a magnetic signal.

DXF-701WS/701WSCE Viewfinder

You can automatically switch the scan size of the DXF-701WS/701WSCE in accordance with the setting of the camcorder.



① BATT (battery) indicator (red)

This indicates when the battery capacity is low.

② TAKE/TALLY indicator (orange)

When using the ClipLink function while shooting, this indicator lights when the TAKE button (⑥ on page 12) has been pressed to set a Mark IN point and goes out when a Mark OUT point is set.

③ REC/TALLY (recording/tally) indicators (red)

- From the time when you press the VTR button (⑫ on page 12 and ⑫ on page 28) on the lens (not supplied) or camcorder, this flashes until recording starts, then stays on continuously during recording.
- This is also used to indicate a fault. (See page 127.)
- The lower indicator can be disabled by menu setting. (See page 89.)


Location and Function of Parts

- ④ SHUTTER indicator (red)**
This lights when the SHUTTER switch (⑤ on page 12) is in the ON position. (If the EVS is selected, the indicator will not light.)
- ⑤ GAIN UP indicator (orange)**
This lights when the gain is 3 dB or more.
- ⑥ Eyepiece focusing knob**
Turn this to adjust the viewfinder focus to match your eyesight. (See page 118.)
- ⑦ Accessory fixing screw hole**
Attach optional video lights or other accessories here.
- ⑧ Retaining catch**
Pull up this catch when removing the viewfinder. (See page 34.)
- ⑨ Tally lamp**
When the TALLY switch (⑫) is in the ON position, this operates in the same way as the REC/TALLY indicators (④ on page 29).
- ⑩ Eyepiece release catch**
To view the viewfinder screen directly, press this catch, and hinge up the eyepiece.
- ⑪ BRIGHT (brightness) control**
This adjusts the brightness of the viewfinder image. (See page 118.)
- ⑫ CONTRAST control**
This adjusts the contrast of the viewfinder image. (See page 118.)
- ⑬ PEAKING control**
This adjusts the outline intensity of the viewfinder image. (See page 118.)
- ⑭ TALLY switch**
Set this switch to the ON position to use the tally lamp ⑨.
- ⑮ Viewfinder connector (20-pin)**
Connect this to the VF connector (⑫ on page 12).

Inserting and Replacing the Lithium Battery

The camcorder uses a lithium battery to retain stored data. When using the camcorder for the first time, be sure to insert the supplied lithium battery (CR2032). The camcorder will not operate correctly without this lithium battery.

Lifetime of the lithium battery

When the lithium battery's voltage falls, the lithium backup battery warning  appears in the display window. If this warning appears, replace the lithium battery (CR2032) **within three or four days**. The lithium battery has an average service life of about two years, however operation with the optional DSBK-301A in ClipLink mode will shorten the lifetime until about one year.

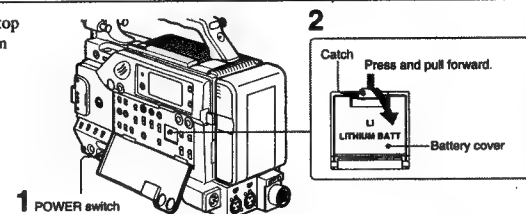
Inserting or replacing the lithium battery

Notes

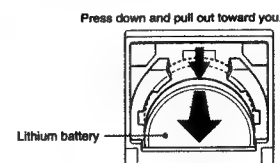
- Carefully read the instructions for inserting and replacing the lithium battery. Lithium batteries may explode if misused.
- Use only CR2032 Lithium Batteries. Other types of lithium batteries may come loose when the camcorder is moved. If you have difficulty finding CR2032 Lithium Batteries, contact your Sony dealer.

1 Turn the POWER switch on.

2 Press down the catch at the top of the battery cover and open the cover.



3 Take out the lithium battery.



4 Reverse step 3 to insert a replacement lithium battery. Make sure that the + symbol on the battery is facing you.

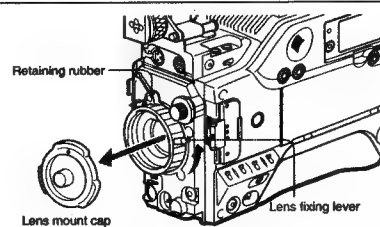
5 Close the battery cover.

Fitting the Lens

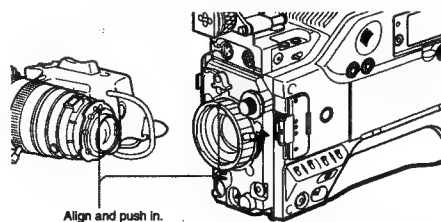
Note

Be sure to turn off the power before fitting the lens.

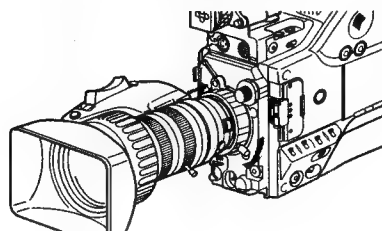
- 1 Remove the retaining rubber which prevents the lens mount from coming loose, then raise the lens fixing lever, and remove the lens mount cap.



- 2 With the lens fixing lever turned fully counterclockwise, push in the lens, aligning the projection on the lens with the cutout on the camcorder.

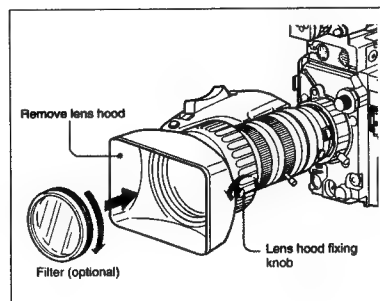


- 3 Supporting the lens, turn the lens fixing lever fully clockwise. Replace the retaining rubber on the lens mount.



Fitting optional filters

Loosen the lens hood fixing knob to remove the lens hood, then attach the filter.

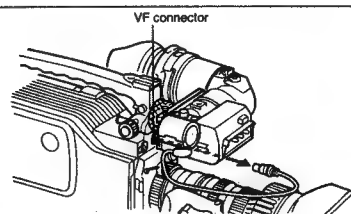


Using Accessories

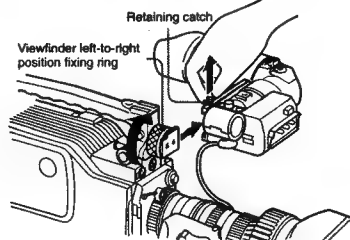
Using the Viewfinder

Removing the viewfinder

- 1 Pull the viewfinder plug out of the VF connector on the front.



- 2 Loosen the viewfinder left-to-right position fixing ring, then pulling up the retaining catch, slide the viewfinder out.



To fit the viewfinder

Reverse the removal procedure. (You need not hold the retaining catch up.)

Left eye adaptor

By fitting a left eye adaptor, you can use the camcorder with your left eye to the viewfinder.

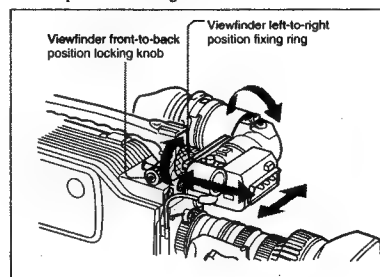
Note

You cannot stow the camcorder with a left eye adaptor attached in the carrying case.

For details, consult your Sony dealer.

Adjusting the viewfinder position

To adjust the viewfinder left-to-right position, loosen the viewfinder left-to-right position fixing ring, and to adjust the front-to-back position loosen the viewfinder front-to-back position locking knob.



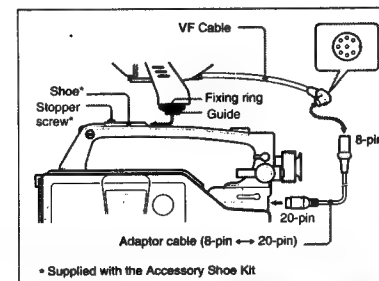
Fitting the 4-inch/5-inch Electronic Viewfinder

You can fit the optional DXF-51 (5-inch)/DXF-41 (4-inch) Electronic Viewfinder. To fit, the following parts are required.

Required parts to fit

Name	Part No.
Accessory Shoe Kit	A-8274-968-A
Adaptor cable (8-pin ↔ 20-pin) (DXF-41 only)	1-783-665-11

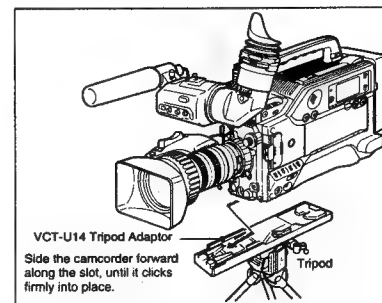
For details, consult your Sony dealer.



* Supplied with the Accessory Shoe Kit

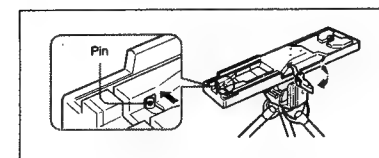
Fitting to a Tripod

First fit the VCT-U14 Tripod Adaptor to the tripod, then mount the camcorder on the tripod adaptor.

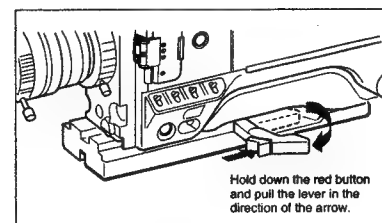


Note

After removing the camcorder, if the tripod adaptor pin has not returned to its original position, hold down the red button and move the lever in the direction of the arrow to return the pin to its original position. It is not possible to mount a camcorder with the pin left out.



Removal



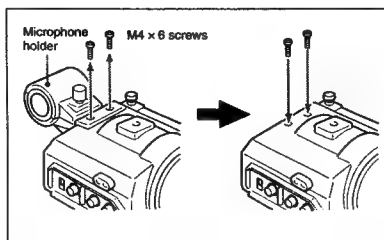
Using Accessories

Using an Optional Microphone

To use a long microphone such as the optional ECM-670/672, remove the supplied microphone holder, and fit an optional CAC-12 Microphone Holder to the camcorder, then mount the microphone in this holder.

Removing the supplied microphone holder

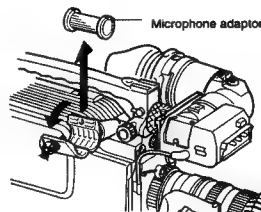
Remove the two microphone holder retaining screws (M4 × 6) from the viewfinder, remove the microphone holder, then replace the screws in their original positions.



Fitting an optional microphone

Use the following procedure to attach an optional ECM-670 Microphone.

Loosen the screw of the CAC-12 Microphone Holder, then open the holder and replace the microphone adaptor with the one supplied with the ECM-670 Microphone.



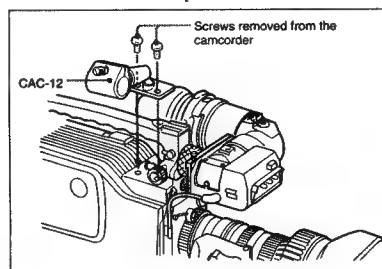
Fitting optional microphones (operable with a 48 V supply) other than the ECM-670

Use the same fitting procedure as for the ECM-670, but note the following differences with respect to the microphone adaptor.

ECM-672: no microphone adaptor required.
Slender microphones (19 mm (3/4 inch) diameter): use the microphone adaptor supplied with the CAC-12.

Fitting the optional CAC-12 Microphone Holder

Remove the two retaining screws (M3 × 8) for the optional microphone holder, then use these screws to attach the CAC-12 Microphone Holder.



Using a Video Light

For the DSR-500WS/500WSP, you can use the Anton Bauer Ultralight 2 or equivalent. Use a video light powered by 12 V with maximum power consumption of 30 W.

- If you connect the video light to the video light connector on the DSR-500WS/500WSP (page 23) and set the LIGHT switch to AUTO (page 13), you can turn the light on and off automatically as you start and stop VCR operation.
- The output of the video light connector on the DSR-500WS/500WSP is controlled to 12 V even when the camcorder is supplied with 12 V or more power (through the DC IN connector or battery pack). The brightness or color temperature of the light will not change according to voltage increase.

Notes

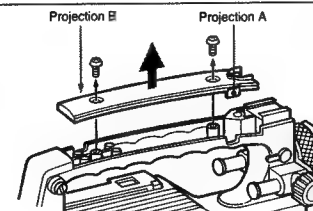
- Do not use the video light with power consumption of over 30 W.
- The brightness or color temperature of the light will change when the supplied voltage is under 12 V (through the DC IN connector or the battery pack).

To fit the video light

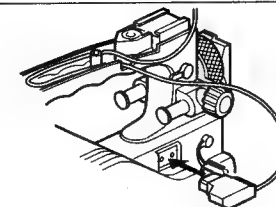
Fit the video light to the camcorder grip or the accessory shoe on the viewfinder and connect the video light cable to the video light connector.

When using a video light with a long cable
You can pass a part of the cable through the camcorder grip.

- 1 Remove the cover of the camcorder grip and break off projection A (see the figure).

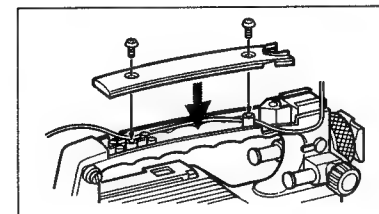


- 2 Pass the cable through the grip as shown in the figure and replace the cover.



When using equipment other than the camcorder for power supply

Break off projections A and B on the camcorder. (See step 1 of the previous section "When using a video light with a long cable".) Insert the cable into the grip from the front hole and take out from the rear hole as shown in the figure.

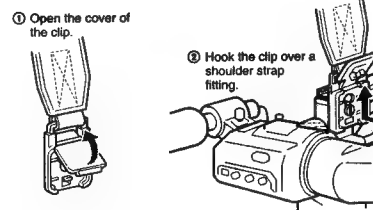


Using Accessories

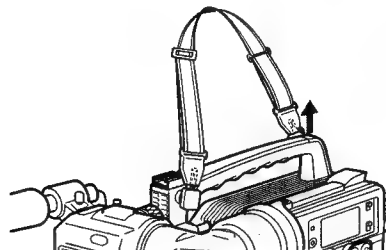
Fitting the Shoulder Strap

This section describes the procedure for fitting the supplied shoulder strap to the camcorder.

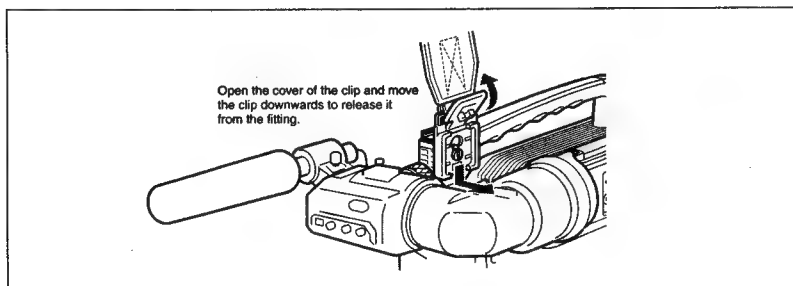
- 1 Fit one of the clips to a shoulder strap fitting.



- 2 Fit the other clip to the shoulder strap fitting on the other side of the grip in the same way.



Removing the shoulder strap



Connecting to Audio System

The DSR-500WS/500WSP is able to record sound not only from the microphone attached but also from a wireless microphone or an external audio system.

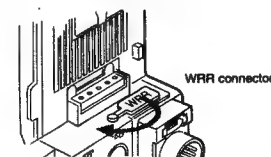
Using a wireless microphone system

You can use the wireless microphone system including a WRT-810A/830A UHF Wireless Microphone and a WRR-810A/855A/860A UHF synthesized tuner to record sound.

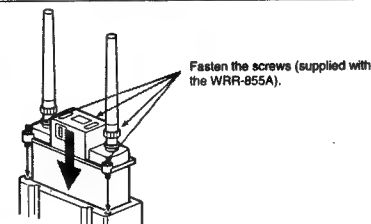
For details on using the wireless microphone system, see the operating instructions for the microphone and tuner.

To connect a WRR-855A

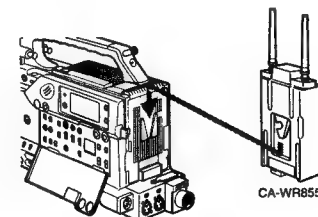
- 1 Open the cover of the WRR connector.



- 2 Insert the WRP-855A into the CA-WR855.



- 3 Fit the attachment plate on the rear side of the CA-WR855 to the V-groove on the battery attachment interface, and then slide the CA-WR855 down until it connects to the WRR connector.

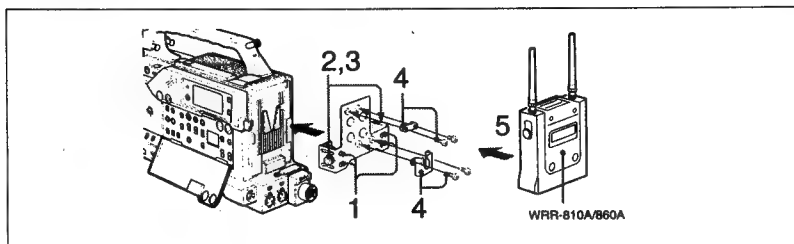


- 4 Set one of the AUDIO IN (CH-1/CH-2) switches to WRR.

Using Accessories

To connect a WRR-810A/860A

Attach the WRR tuner fitting (not supplied) (Part No. A-8278-057-A) to the rear of the camcorder as shown in the following figure.

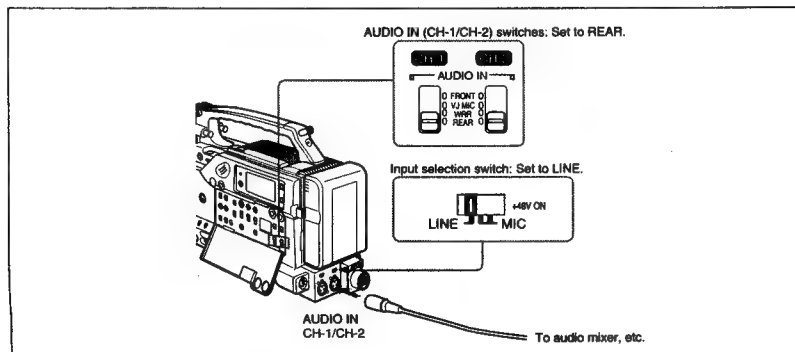


- 1 Pass a screwdriver through the holes and tighten the screws.
- 2 Loosen the adjustment screws.
- 3 Adjust the metal fitting position for a battery pack to be attached, and tighten the adjustment screws to fix its position.
- 4 Attach the holder kit (two fittings and four screws, supplied with the tuner) to the WRR tuner fitting (one for the upper position and the other for the lower position).
- 5 Mount the tuner on the WRR tuner fitting.

For details about the WRR tuner fitting (Part No. A-8278-057-A), contact your Sony dealer.

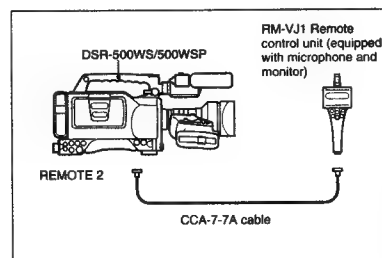
Using an external audio system

Connect an audio mixer or other external audio system component to the AUDIO IN CH-1/CH-2 connector as shown below.



Using the Optional RM-VJ1 Remote Control Unit (Equipped With Microphone And Monitor)

You can control the camcorder while watching the image on the LCD screen of the Remote Control Unit if you connect the RM-VJ1 Remote Control Unit to the camcorder.



Note

Be sure to use the CCA-7-7A Cable only when connecting the RM-VJ1.

When using lens designed for the power zoom and focus

Use the following lens when controlling the zoom and focus from the RM-VJ1:

Fujinon: A19X8.7 BRD-S28
A19X8.7 BERD-S28 (with the extender)
A19X8.7 BRRD-S28 (with the ratio converter)

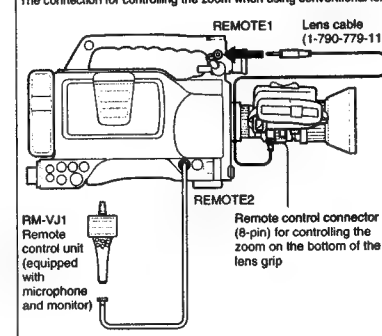
Canon: YJ18X9B KAS-SS12
YJ18X9B IAS-SS12 (with the extender)

For details on these lens or other lens designated for the power zoom and focus, consult Fujinon or Canon dealer.

When using conventional lens

When using conventional lens, such as VCL-918BY, you can control the zoom if you use the optional lens cable (Sony product number: 1-790-779-11). For details on the cable, consult your Sony dealer.

The connection for controlling the zoom when using conventional lens

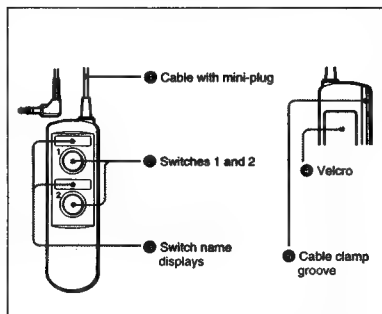


Using Accessories

Using the RM-LG1 Remote Control Unit

You can control the camcorder using the supplied RM-LG1 Remote Control Unit.

Location and Function of Parts



1 Cable with mini-plug

Connect to the REMOTE connector 1 (⑤ on page 23) on the DSR-500WS/500WSP.

2 Switches 1 and 2

You can assign functions to these switches using the advanced menu page 3 (see page 88) of the DSR-500WS/500WSP.

Each can be used as the following types of switch: VTR switch, MARK switch, CUE switch, or NG switch.

At the shipping of the DSR-500WS/500WSP, switch 1 is set as the VTR switch and switch 2 is set as the MARK switch.

For information about the advanced menu and function of each switch, see "Location and Function of Parts" on page 12 and "Viewfinder Advanced Menu" on page 86.

3 Switch name displays

Stickers (supplied with RM-LG1) can be attached here to indicate which functions are assigned to the switches 1 and 2 ②.

4 Velcro

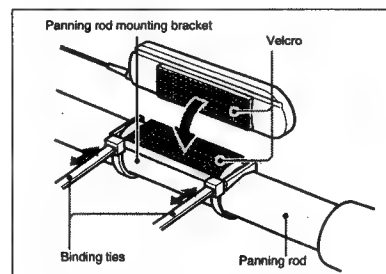
When using the unit on the panning rod of the tripod, this is used to attach the unit to the panning rod mounting bracket (supplied with RM-LG1).

5 Cable clamp groove

When the cable ① is passed underneath the unit, the cable can be placed in this groove.

Attaching the RM-LG1

Use the binding ties and panning rod mounting bracket to attach the unit to a panning rod.



Removing the RM-LG1

Lift up the tab to loosen the binding ties.

Using the Optional LC-DS500 Carrying Case

For details on using the carrying case, refer to the instruction manual supplied with the carrying case. For detail on the time that the carrying case will appear on the market, consult your Sony dealer.

Using the Optional LC-DS300SFT Soft Carrying Case

For details on using the soft carrying case, refer to the instruction manual supplied with the soft carrying case.

Connections

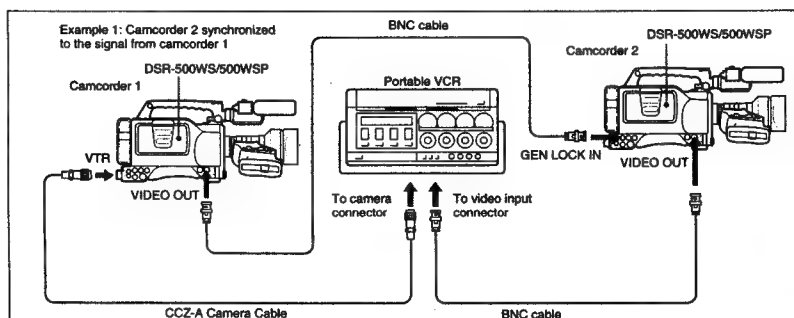
Connecting a Number of Camcorders

When using two or more synchronized camcorders, connect an external sync signal to the GEN LOCK IN connector, supplying a VBS or BS signal. The camcorder will then operate synchronized to this signal.

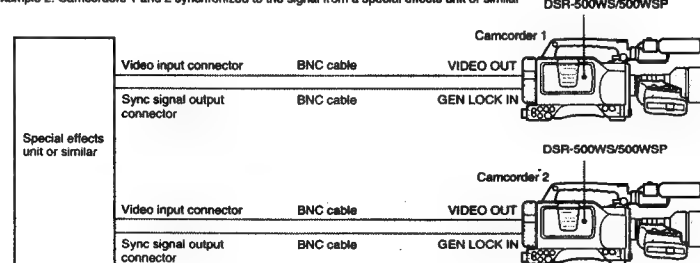
You can adjust the synchronization using the basic menu. (See page 81.)

Note

When you fit the optional DSBK-501/501P, set the VIDEO IN to CAM using the basic menu page 4. (See page 81.)

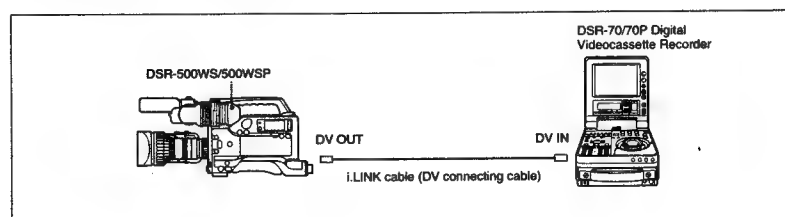


Example 2: Camcorders 1 and 2 synchronized to the signal from a special effects unit or similar



Connecting the DSR-70/70P Digital Videocassette Recorder (Optional DSBK-140 is Required)

You can do cut editing and digital dubbing when connecting the DSR-70/70P with fitting the optional DSBK-140, using an i.LINK cable (DV connecting cable).



Notes

- The camcorder does not support the noiseless function of the various speed playback.
- The slow playback will be automatically released to protect the tape if the slow playback lasts for about one minute.

- When dubbing tapes using the DSR-70/70P, a continuous recorded section of approximately five seconds is required before the recording start point. It is recommended to record beforehand color bars or a similar signal at the start point of the source tape to be dubbed on this unit.

Connecting an External VCR

You can use a following external VCR connected to the VTR connector (26-pin) or the DV OUT connector for recording.

Notes

- There is no power supply connection between the camcorder and VCR. Provide separate power supplies.
- The VTR connector always outputs the signals from the camera (impossible to output the playback video of the internal VCR), and disallows the CCU connection.

Connector	VCR	Connecting cable
VTR connector	BVW-50/50P/35/35P (portable)	CCZ-A Camera cable (max. length 10 m (33 ft.))
VTR connector	VO-8800/6800 (U-matic)	CCZQ-A Camera cable (max. length 10 m (33 ft.))
DV OUT connector	Digital Videocassette Recorder DSR-20/20P/70/70P, etc.	i.LINK cable (DV connecting cable) (max. length 4.5 m (14 ft.))

Power Supply

The following power supplies can be used with the camcorder.

- BP-L40/L60/L60A/L90/L90A lithium-ion battery pack
- NP-1B Ni-Cd Battery Pack (The DC-L1 Battery Adaptor is required.)
- BP-90A Ni-Cd Battery Pack (The DC-L90 Battery Adaptor is required.)

- AC power (The AC-550/550CE, AC-DN1/DN2A or CMA-8A/8ACE AC Adaptor is required.)

Alternatively, you can make combined use of internal and external batteries, by mounting one of the above batteries as an internal battery and connecting an external battery that can be a BP-90A contained in a DC-210 Battery Adaptor and connected to the DC IN connector of the camcorder.

Using a BP-L40/L60/L60A/L90/L90A Battery Pack

With a battery pack, the camcorder will operate continuously for the time shown below.

BP-L40: Approx. 70 minutes

BP-L60A: Approx. 140 minutes

BP-L90A: Approx. 230 minutes

Before use, charge the battery pack with a BC-L50/L100/L100CE Battery Charger.

Notes on using the battery pack

- A warm battery pack may not be able to be fully recharged.
- Even when fully charged, battery packs gradually lose their charge naturally. Use the battery packs as soon as possible after recharging.
- To prolong the life of battery packs, store them in a cool place (about 20°C (68°F)), and charge in a place with an ambient temperature between 10°C and 30°C (50°F to 86°F).
- At low temperatures, the usable time of battery packs decreases. When the ambient temperature is 0°C (32°F), usable time decreases by about 10%. (However, the usable time is affected by the power

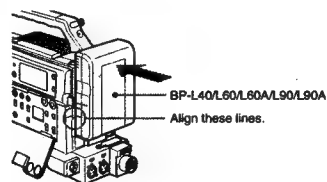
consumption of the connected camcorder and the usage status of the battery packs.) The usable time of battery packs increases if they are warmed to the room temperature (about 20°C (68°F)) before use at low temperatures.

- If you use the BP-L40 at temperatures of 0°C (32°F) or below, when power consumption of the camcorder and accessories is 40 W or higher (due to using a video light, for example), power may break after a short time (a few minutes). To increase the usable time, store the BP-L40 in a warm place and power on the connected camcorder before the BP-L40 cools down.
- Compared to the BP-L40, the BP-L60/L60A/L90/L90A offer better performance at low temperatures. The BP-L60/L60A/L90/L90A are recommended for use at low temperatures.
- Carrying a spare battery pack is recommended.

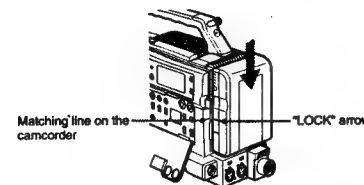
The BP-L40/L60/L60A/L90/L90A is free from memory effect. There is no need to discharge it fully before recharging.

Attaching the battery pack

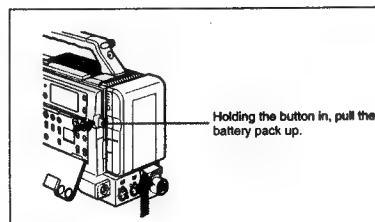
- 1 Press the battery pack against the rear of the camcorder, aligning the side line of the battery pack with the line on the camcorder.



- 2 Slide the battery pack down until its "LOCK" arrow points at the matching line on the camcorder.



Detaching the battery pack



Avoiding breaks in operation due to dead batteries

If you use both an internal battery pack and an external battery connected to the DC IN connector at the same time, you can avoid breaks in operation due to the dead batteries.

When the external battery begins to fall and an internal battery pack is also used

Remove the DC output cable of the external battery from the DC IN connector. The power source will switch to the internal battery pack.

When the external battery begins to fall and an internal battery pack is not used

First load the camcorder with a fully charged internal battery pack, then remove the DC output cable of the external battery from the DC IN connector. The power source will switch to the internal battery pack. To use an external battery again, connect a fully charged external battery to the DC IN connector before unloading the internal battery pack. The power source will switch to the external battery.

Continuous operation when operating with only an internal battery pack

First, connect a fully charged external battery to the DC IN connector, then change the internal battery.

Notes

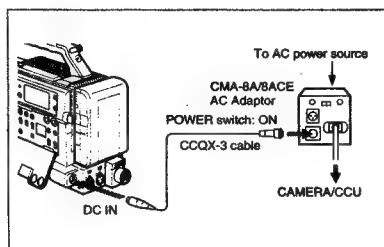
- Whenever an internal battery pack is loaded and an external battery is connected to the DC IN connector, the external battery is always used as the power source.
- There may be some noise on the video or audio signal at the instant the power sources are switched.

Power Supply

Using an AC Adaptor

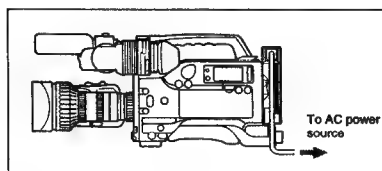
Using a CMA-8A/8ACE AC Adaptor

Connect the camcorder to the AC power supply as shown in the following figure, and turn the POWER switch of the CMA-8A/8ACE to ON.



Using an AC-DN1/DN2A AC Adaptor

Mount the AC-DN1/DN2A on the camcorder in the same way as a battery, then connect to the AC power source.



Note

When power consumption of the camcorder and accessories is 38 W or higher, use the AC-DN2A AC adaptor (lower than 150 W).

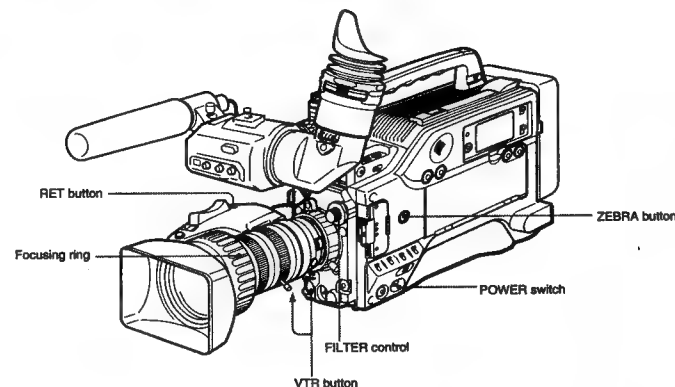
Using the Anton Bauer Intelligent Battery System

You can equip the camcorder with a special battery mount which the Anton Bauer Corporation has developed for its Intelligent Battery System and Ultralight System.

When the camcorder is used with an Anton Bauer Digital Magnum series battery, the remaining battery capacity is shown numerically in the viewfinder display.

Contact your Sony dealer for more information.

Basic Procedure for Shooting



- 1 Power the camcorder.
- 2 Set the FILTER control appropriately for the lighting conditions.

Filter setting	Lighting conditions
1 (3200K/3000K) ^{a)}	Studio halogen lighting (incandescent), sunrise and sunset.
2 (5600K + 1/8 ND)	Sunlight. This setting includes a 1/8 neutral density filter (reducing the exposure by the equivalent of three stops). Use it to prevent hunting ¹⁾ or to reduce the depth of field ²⁾ .
3 (5600K)	Cloudy or rainy outdoor shooting, and fluorescent lighting.
4 (5600K + 1/4 ND)	Sunlight. This setting includes a 1/4 neutral density filter (reducing the exposure by the equivalent of six stops). Use it to prevent hunting ¹⁾ or to reduce the depth of field ²⁾ .

a) You can switch it to 3000 K by menu setting. (See page 88.)

Note

Noise may appear in the EZ mode if the FILTER control is set to 2 or 4, and iris is set to fully open. In such case: when the FILTER control is set to 4, set it to 2; when set to 2, set it to 3.

- 3 Check the switch settings on the camcorder. (See pages 12 to 26).

If there is not sufficient time to check the camcorder settings, you can use "easy mode" by setting the EZ MODE button ON. The camcorder is automatically adjusted to standard settings, and the iris and the white balance are adjusted automatically. (See page 91.)

- 4 Check the settings in the basic menu (page 80) and advanced menu. (page 86.)
- 5 Check the lens settings (pages 32 and 33) and flange focal length adjustment. (page 119.)
- 6 Adjust the eyepiece focus, and the contrast and brightness of the viewfinder image. (page 118.)

- 1) **Hunting:** This occurs if the automatic iris function is not able to reach a stable state, and as a result the image brightness keeps changing, alternately lighter and darker.
- 2) **Depth of field:** This is the range over which the subject is sharply in focus.

Basic Procedure for Shooting

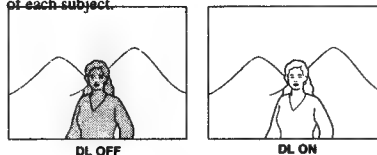
- 7 Check the sound system settings.
 - Microphone connections
 - Settings on the VCR section
- 8 If required, switch on the center marker and/or safety zone (basic menu page 6 and advanced menu page 4) and zebra pattern (ZEBRA button) in the viewfinder image.
- 9 Adjust the white balance (page 112) and black balance (page 115).
- 10 Turn the focusing ring so that the subject is sharply in focus.

It may be convenient to use the EZ FOCUS button for the "easy focus" function. (See page 13.)
- 11 Set up the VCR section according to your shooting objectives, then start recording with the VTR button.
 - During recording, the REC/TALLY indicator(s) in the viewfinder light(s), and "REC" appears on the viewfinder screen.
 - Depending on the setting of the REC TIME switch (see page 21), you can display the total recording time or the length of the current cut on the viewfinder screen.
 - You can use the AUDIO LEVEL knob on the right side to manually adjust the channel 1 audio level. To do this, you must first set up the VCR section to enable manual adjustment of the audio recording level. (See page 20.)
- 12 To pause recording, press the VTR button again.

Using DynaLatitude Function

This function enables detailed adjustment of contrast control in each pixel in accordance with a histogram of luminance signal levels.

If use this function, the camcorder automatically adjusts contrast control by detecting luminance levels of each subject.



However, if a subject moves in shooting, the brightness of the subject may be changed; noise on the black portion may increase depending on subjects. For turning on/off the function, see page 88, and for the effect level, see page 81.

Recording

Cassettes for the DSR-500WS/500WSP

The DSR-500WS/500WSP can use standard-size and mini-size DVCAM and DV series metal tape cassettes. (To ensure high-quality playback, editing, and storage of recorded contents, we recommend using highly reliable DVCAM cassettes). The following table lists the cassettes that can be used in the DSR-500WS/500WSP.

Model name	Size
PDV-64ME/64MEM/94ME/124ME/124MEM/184ME/184MEM	Standard size
PDVM-12ME/22ME/32ME/32MEM/40ME/40MEM	Mini size

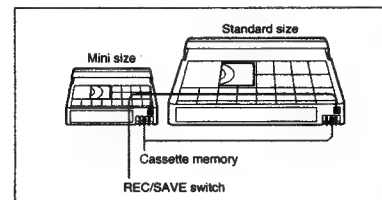
The numbers in the model names show maximum recording/playback time (minutes) for each model. For example, the maximum recording/playback time of the PDV-184ME is 184 minutes.

Notes

- If you insert an incorrect type of cassette, it will be automatically ejected.
- When using a DV cassette, the maximum recording time is reduced to two-thirds of the time indicated on the cassette. For example, up to 40 minutes of recording can be done on a 60-minute DV cassette.

DVCAM cassettes

The following figure illustrates the DVCAM cassette's appearance.



For ClipLink shooting, a DVCAM cassette including "cassette memory" is necessary. In the cassette memory, data required for editing the recorded video (ClipLink log data) is stored. The DSR-500WS/500WSP can record or play back the cassettes with cassette memory of 16 Kbits or less.

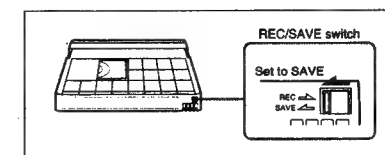
For details of ClipLink log data, see "ClipLink Shooting" (page 68).

Notes on using cassettes

- Before storing the cassette, rewind the tape to the beginning and be sure to put the cassette in its storage case, preferably on end instead of flat on its side. The storage case of a DVCAM cassette is specially designed to ensure a long-period storage of the tape. Storing a cassette in any other condition (not rewound, out of its case, etc.) may cause the video and audio contents to become damaged over time.
- If the cassette memory connector (contact point) becomes dirty, connection problems may occur and cause a loss of functions. Remove away any dust or dirt from this area before using the cassette.
- If the cassette is dropped on the floor or otherwise receives a hard impact, the tape may become slackened and may not record and or play back correctly. For instructions on removing tape slack, see next page.
- Follow the instructions on page 53 to insert a cassette, or the camcorder may be damaged.

Preventing accidental erasure

Set the REC/SAVE switch to SAVE to prevent accidental erasure of recorded contents.



If you insert a cassette into the camcorder when this switch is set to SAVE, the camcorder will not record when you press the VTR button.

To enable recording

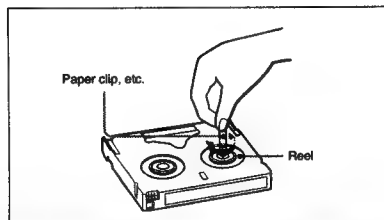
Set the REC/SAVE switch back to REC.

Recording

Checking the tape for slack

Turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack. Insert the cassette into the cassette holder, close the cassette holder, and after about 10 seconds take it out.

See page 53 on how to insert a cassette.



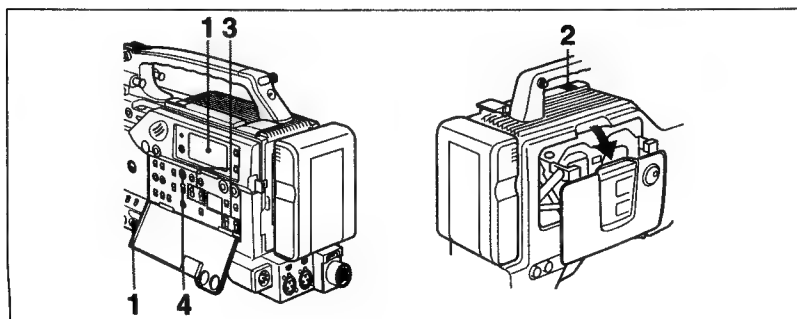
Recording on the Internal VCR

This section describes basic recording operations using the internal VCR.

Notes

- When you will not perform ClipLink shooting, set the ClipLink function to OFF in the VCR menu. (See page 109 for menu setting and see page 68 for details of ClipLink shooting.)
- Before shooting, mount or connect any required equipment or accessories and check the power supply. (See Chapter 2 "Fitting and Connections".) Also, it is desirable to make sure for problems in camcorder's internal operations using the auto-check function. (See "Menu 210 Using Auto-Check Function" on page 107.)

- When using a tape recorded by the DSR-500WS/500WSP to transfer digital (video/audio/time code) signals at four times normal speed from the DSR-85/85P Digital Videocassette Recorder to the ES-7 EditStation for editing purposes, there must be about at least 40 seconds of recording on the tape before the IN point. To perform editing without problems, it is recommended that you pre-record at least 40 seconds of color bar signals at the beginning of the tape.
- When dubbing tapes using the DSR-70/70P, a continuous recorded section of approximately five seconds is required before the recording start point. It is recommended to record beforehand color bars or a similar signal at the start point of the source tape to be dubbed on this unit.



- 1 Set the POWER switch to ON and check the following items in the display window.

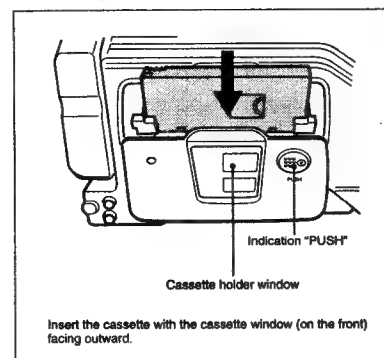
Item to check	Indication and steps	See also
How is the battery?	BATT E [■■■■■■■■] F: The battery is fully charged. If two or fewer marks ■ appear and the indication is blinking, replace the battery.	• "Display window" (page 16)
Has the lithium battery been inserted and is it charged?	Make sure that the [L] is not shown in the display window. If it is shown, replace the lithium battery.	"Inserting and Replacing the Lithium Battery" (page 31)
Is there a condensation problem?	Make sure that the "HUMID" indication is not shown in the display window. If it is shown, do not use the equipment until the "HUMID" indication disappears.	"Condensation" (page 128)

- 2 Press the EJECT button to open the cassette holder, and insert the cassette.

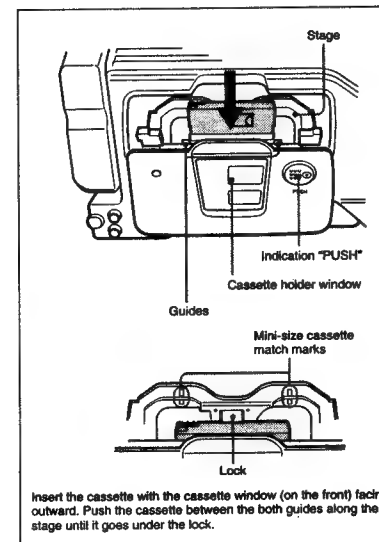
Make sure that the cassette's REC/SAVE switch is set to REC, then check for tape slack before loading the cassette.

For details on handling cassettes, see "Cassettes for the DSR-500WS/500WSP" on page 51.

Inserting a standard-size cassette



Inserting a mini-size cassette



Press on "PUSH" on the cassette holder solidly to close the holder.

(Continued)

Recording

Notes

- Turn the power on and then insert or eject the cassette.
- When inserting a mini-size cassette, confirm the cassette is under the lock (see the figure on the previous page), and then close the cassette holder. If the cassette is not inserted fully under the lock, a stopper will prevent the cassette holder from closing when you press down on it.
- Internal parts of the camcorder may become bent or otherwise damaged if you attempt to close the cassette holder after inserting a mini-size cassette in the wrong direction (such as with the cassette turned backside front so the reel holes face the cassette holder window or with the cassette turned sideways so that a short side enters first).
- If **CL** appears in the display window when the cassette is loaded, it means that data has already been recorded into the cassette memory. If you record under this condition whether the ClipLink function is available or not, the existing cassette memory data will be overwritten. To avoid this, insert a new cassette.

- After inserting the cassette, close the cassette holder solidly by pressing on the "PUSH" indication on the holder. Unless the cassette holder is closed solidly, the tape will not be loaded and the tape operation buttons will not function. If you find the tape operation buttons inoperable, press on the "PUSH" indication again to make sure that the cassette holder is solidly closed.

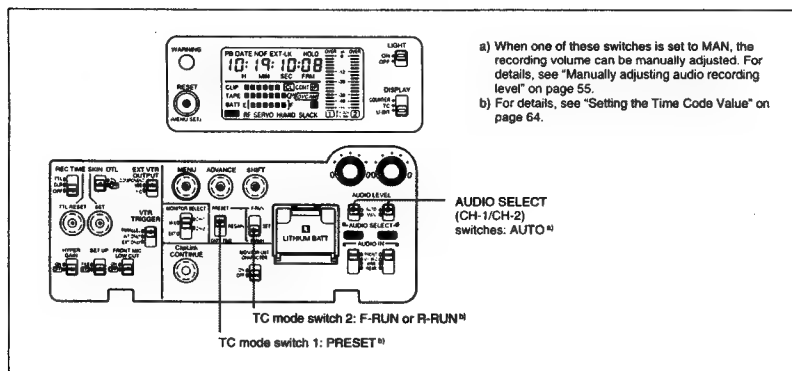


Do not insert cassette sideways.



Do not insert cassette backside front.

- 3** Make the switch settings shown in the figure below.



- 4** Display menu 212 and select the audio recording mode (two-channel recording mode or four-channel recording mode).

For menu operation, see "Menu 212 Selecting Audio Recording Mode" (page 109).

Note

One of the following warning indications appears in the display area when you change the audio mode setting during recording pause.

Warning indication	Status
Fs 48k (flashes four times per second)	Attempting to switch from 32-kHz mode (four-channel mode) to 48-kHz mode (two-channel mode).
Fs 32k (flashes four times per second)	Attempting to switch from 48-kHz mode (two-channel mode) to 32-kHz mode (four-channel mode).

The recordings at switching points prevent editing. Avoid changing the audio mode once you have started recording.

- 5** Set up the camcorder to suit your recording objectives, and press the VTR button on the camcorder or lens.

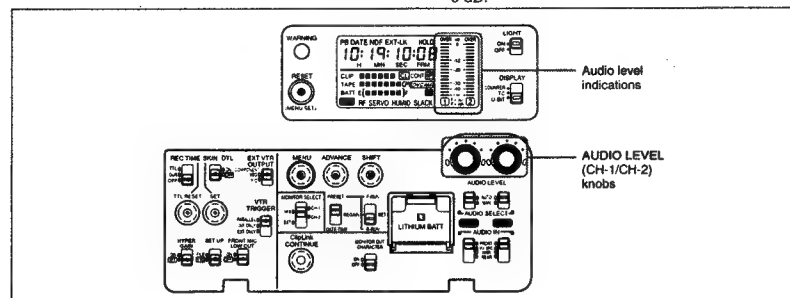
Recording begins when the TALLY indicator stays lit after blinking for a moment.

During recording, the tape transport buttons (EJECT, REW, F FWD, PLAY, and STOP) cannot be used.

Operation	Step
To view image being shot	<ul style="list-style-type: none"> • Look into the viewfinder. • Connect a video monitor to the MONITOR OUT connector, VIDEO OUT connector, or S VIDEO OUT connector.
To listen to audio track being shot	Connect an earphone to the EARPHONE connector or listen to the audio from the speaker.
To pause recording	Press the VTR button on the camcorder or lens. For instructions on continuing to record after a pause, see "Back Space Editing" (page 58).
To stop recording	Press the VTR button on the camcorder or lens, then press the STOP button. With this state, it is impossible to start back space editing.
To remove the cassette	Check that the power is on, then press the EJECT button to open the cassette holder and remove the cassette. Close the cassette holder.

Manually adjusting audio recording level

- 1** In step 3 above ("Recording on the Internal VCR"), set the AUDIO SELECT (CH-1/CH-2) switches to MAN (see page 54).
- 2** While checking the audio level in the display window, turn the AUDIO LEVEL (CH-1/CH-2) knobs for the channel being used for microphone or wireless microphone system connection (CH-1 or CH-2) so that the maximum audio level is under 0 dB.



Recording

When the battery is getting exhausted

When the battery is getting exhausted, the BATT indication in the display window blinks once a second. (see page 17.) Replace the battery with a charged battery immediately.

If you continue to use the low battery, the BATT indication will blink four times a second, and the operation will stop.

For description of how to replace batteries, see "Power Supply" on page 46.

Notes

- Turn the POWER switch OFF before replacing the battery.
- If using two NP-1B batteries, be sure to replace both batteries at the same time.

Recording an External Video Signals

When the optional DSBK-501/501P Analog Composite Input Board is fitted to this camcorder, you can record the external video signals.

- 1 Connect the external video signals to the GEN LOCK IN/VIDEO IN connector.
- 2 Set VIDEO IN to EXT using the basic menu page 4.
- 3 Press the EJECT switch to open the cassette holder, and insert the cassette.
- 4 Press the VTR button on the camcorder or lens.

The camcorder starts recording.

Notes

- If the external video signals include noise, such as jitter, the camcorder may not record signals properly.
- When recording the external analog video signals, signals are not output from the S VIDEO OUT connector.

Recording on an External VCR Using the VTR Connector (26-pin)

Set the VTR TRIGGER switch in the following way. (You can change the setting during recording.)

Simultaneous recording on the external and internal VCR: PARALLEL

Recording on the external VCR: EXT ONLY

When the VTR TRIGGER switch is set to INT ONLY, the camcorder controls only the internal VCR even if an external VCR is connected.

For information about connectable VCRs, see "Connecting an External VCR" (page 45).

Recording on the internal and external VCRs simultaneously

- 1 Set the switches as shown in the table below.

Switch	Setting
VTR TRIGGER switch	PARALLEL
EXT VTR OUTPUT switch	Set depending on the connected VCR.
Audio input level setting switch on the connected VCR	-20 dB

- 2 Put the external VCR in the recording pause mode.
- 3 Press the VTR button on the camcorder or lens.

The both VCRs start recording simultaneously.

To pause recording, press the VTR button on the camcorder or lens again.

The both VCRs go into the recording paused state.

If either VCR comes to the end of tape during recording, one VCR stops at the end of the tape, and the other will continue recording.

To restart simultaneous recording, perform the following.

When the internal VCR has run out of the tape:
Change the cassette, and press the VTR button on the camcorder or lens.

When the external VCR has run out of the tape:
Change the cassette, and start recording with the controls on the external VCR.

Note

After replacing the cassette on the external VCR, do not press the VTR button on the camcorder or lens, as this will pause the internal VCR.

To operate either VCR during recording, change the VTR TRIGGER switch setting. Both VCRs continue recording at the time of switching.

Setting to INT ONLY: The camcorder can operate only the internal VCR.

Setting to EXT ONLY: The camcorder can operate only the external VCR. If you set REC TIME to EXT in the advanced menu page 4, you can change the total recording time (TTL) from of the internal VCR to the one of the external VCR.

Recording on the external VCR only

- 1 Set the VTR TRIGGER switch to EXT ONLY.
- 2 Use the controls on the external VCR to put it in the recording paused state.
- 3 Press the VTR button on the camcorder or lens.

The external VCR starts recording.

To pause recording

Press the VTR button on the camcorder or lens again.

Using the viewfinder to see playback pictures

For the internal VCR: Press the PLAY button.

For the external VCR: Press the RET button on the lens when the internal VCR is in recording or no cassette is inserted in the internal VCR. While holding it down, you can see the return video from the external VCR.

Recording on an External VCR Using the DV OUT Connector

You can record digital audio and video signals in the DV format on an external VCR, using the DV OUT connector.

For information about connectable VCR, see "Connecting an External VCR" on page 45.

Note

When an external equipment, such as VCR, is connected to the DV OUT connector, the ClipLink and the audio fade-in/fade-out function during recording will not work.

Back Space Editing

This section describes the steps for recording several scenes continuously.

- 1 Follow steps 1 to 5 (pages 53 to 55) in the procedure "Recording on the Internal VCR" to begin recording.

To continue the time code that has been recorded on the tape, set the TC mode switch 2 to R-RUN in step 3 (page 54).

For details of time codes, see "Setting the Time Code Value" on page 64.

- 2 When you have finished recording a scene, press the VTR button on the camcorder or lens.

This pauses the recording operation.

Note

Do not do any of the following before the next scene is shot as it will interrupt the recording (the recording will not be continuous).

- Remove the cassette.
- Transport the tape (play, rewind, fast forward).
- Press the STOP button.
- Replace the battery when the camcorder is powered.

- 3 When you are ready to shoot the next scene, press the VTR button on the camcorder or lens again.

This restarts the recording operation.

- 4 Repeat steps 2 and 3 for each scene to be shot.

Operation	Step
Restart an interrupted recording (see step 2 above)	See next section "Starting Back Space Editing at Any Tape Position".
Check the recorded contents	See "Checking the Recorded Contents Immediately After Shooting—Recording Review" on page 61.
Stop recording	Press the VTR button on the camcorder or lens, then press the STOP button.

If there is a long period before shooting the next scene

Once put the camcorder into recording pause mode, it waits a certain (user-definable) period of time and then automatically switches to standby-off mode. When the camcorder is in standby-off mode, it takes time for the recording to start after pressing the VTR button.

For details on setting the timeout value for automatic switching to standby-off mode, see "Menu 207 Setting Standby-On Period" on page 106.

Starting Back Space Editing at Any Tape Position

This section describes the steps for insert a new scene at any desired position on the tape.

The following steps can also be used to restart recording after an interruption has occurred.

- 1 Perform step 1 (page 53) in "Recording on the Internal VCR".
- 2 Insert the cassette containing the previous recording.
- 3 Perform steps 3 and 4 (pages 54 and 55) in "Recording on the Internal VCR".

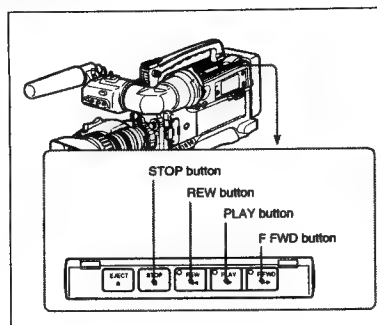
To continue from the last time code of the previous recording, set TC mode switch 1 to REGEN.

For details about time codes, see "Setting the Time Code Value" on page 64.

- 4 Press the PLAY button.

The recorded contents are displayed on the viewfinder screen.

Operation at playback	Step
Fast forward the tape	Press the F FWD button.
Rewind the tape	Press the REW button.



- 5 Press the STOP button when the tape reaches the position where the new recording will start (see the figure above).

This stops the tape.

- 6 Press the RET button on the lens.

This rewinds the tape slightly and runs it until the continue point (specified by step 5), then sets the camcorder to recording pause state.

- 7 Press the VTR button on the camcorder or lens.

This starts recording.

The edit search function enables you to search for the continue position. For details, see next section.

Note

If you turn the POWER switch off during recording, or when recording is paused, the camcorder automatically goes through its shut-down sequence, then powers off. When you next turn the POWER switch on, the camcorder automatically finds the point at which recording ended, and sets itself up so that you can carry in with continuous recording. Note that this operation takes several seconds; do not turn the POWER switch off or replace the battery during this interval, as the automatic recording continuity will be lost.

Note also that the recording continuity is lost in the following cases.

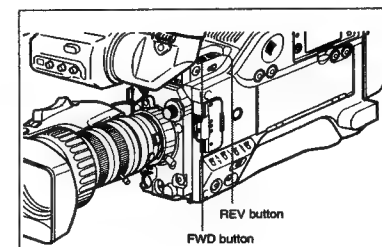
- If the POWER switch is turned on and off repeatedly.

- If the camcorder is left powered off for several hours.
- If the camcorder is subject to severe vibration while powered off.
- If for any other reason the automatic recording continuity function is unable to operate correctly.
- If the lithium battery (CR2032) is exhausted, or if no lithium battery has been fitted.

Using the Edit Search Function While Back Space Editing

You can use the edit search function to find the desired tape location when continuing to record from any other location on the tape. Press and hold one of the EDIT SEARCH buttons to activate the search playback function for as long as you hold down it.

- 1 Turn on the power, then insert a cassette into the VCR.
- 2 Perform steps 2 to 12 in "Basic Procedure for Shooting" (pages 49 and 50).
- 3 Press and hold either of the EDIT SEARCH buttons (REV or FWD).



The tape is moved in reverse or forward search mode for as long as you hold down the REV or FWD button, and the image is shown in the viewfinder.

(Continued)

Back Space Editing

To change the playback speed

Press the REV or FWD button down firmly into the inner position to make the tape move at the faster speed. Press the button down lightly to make the tape move at the slower speed.

Note

Do not shut off the power while using the edit search function. The VCR may not be able to find the continue point.

- Release the REV or FWD button when you find the tape location where you wish to continue shooting.

The VCR enters recording pause mode.

- Press the VTR button on the camcorder or the lens.

The VCR starts recording.

Using the Freeze Mix Function

The freeze mix function superimposes a freeze-frame image of a previously recorded shot on the shooting image displayed on the viewfinder screen.

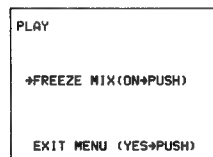
You can use this function to easily frame a subject within the same framework from a previous shot.

Note

When the camcorder is in EZ mode, the freeze mix function is disabled. Press the EZ MODE button to release the EZ mode beforehand. (See page 14.)

- Connect a color monitor to the MONITOR OUT connector and set the MONITOR OUT CHARACTER switch to ON. (It is not necessary to set the MONITOR OUT CHARACTER switch to ON when using only the viewfinder for freeze mix operation.)
- Perform steps 2 to 10 from "Basic Procedure for Shooting" (pages 49 and 50).
- Play back the tape on which the image to be used for framework alignment has been recorded, and press the MENU switch to ON position.

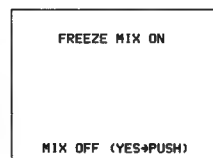
The following indication appears on the screen.



For details of the playback operation, see page 61.

- Press the MENU dial when you see the image you want to freeze.

The frozen playback image is displayed, mixed with the shooting image, in monochrome. The indication "FREEZE MIX ON" appears on the screen.



To release the freeze mix mode, press the MENU dial again.

To change the freeze-frame image

Press the PLAY button.

Use the tape transport buttons to find the desired image and then perform step 4 again.

- Once you have framed your subject, press the MENU dial to cancel the freeze mix function.
- Find the recording start point or insert a new cassette for recording, then begin recording.

Notes

- If you use the tape transport buttons during back space editing, the back space editing mode will be stopped. When you were using the ClipLink function at shooting, if you simply restart the recording you will lose any ClipLink data that was recorded. To avoid this, press the ClipLink CONTINUE button before restarting recording.
- The signal is not output from the DV OUT connector while using the freeze mix function.

Playback — Checking Recorded Contents

Checking the Recorded Contents Immediately After Shooting — Recording Review

Immediately after shooting, you can use the recording review function to automatically rewind and play back the last 2 to 10 seconds of the recording to check the recorded contents.

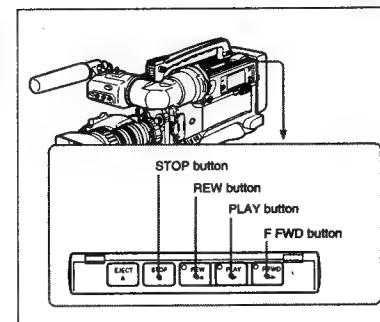
Performing recording review

With recording paused, press the RET button on the lens.

Depending on how long you hold down the button, the tape is automatically rewound over the last 2 to 10 seconds of the recording, and then this last part of the recording is shown in the viewfinder. You can also listen to the recorded sound via an earphone or the speaker. After the recorded part is played back, the camcorder is automatically returns to the pause state.

Notes

- During recording review, do not turn the POWER switch off. The camcorder may not be able to find the continue point.
- If you press the VTR button on the camcorder or lens during recording review, the camcorder stops the recording review and starts recording. In this case (when ClipLink mode is off), it is impossible to start back space editing.



Operation	Step
Fast forward the tape	Press the F FWD button.
Rewind the tape	Press the REW button.
Stop the tape	Press the STOP button.

Note

If two or more series of Index Pictures are recorded separately on the tape, they may be played back at back space editing points.

For details about Index Pictures, see "ClipLink Shooting" (page 68).

Viewing Color Playback

Using a color television or color video monitor, you can view a color playback (with no playback adaptors).

Connect a color television or color video monitor to the MONITOR OUT connector or the S VIDEO OUT connector.

See the previous section "Viewing Monochrome Playback in the Viewfinder" for playback operation.

Viewing Monochrome Playback in the Viewfinder

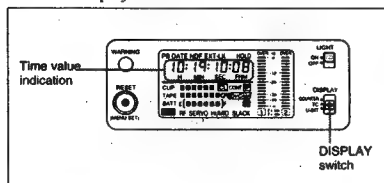
You can view a monochrome playback of the recording in the viewfinder.

- Turn the power on.
- Load a cassette.
- Press the PLAY button.

This starts playback, during which a monochrome playback of the recording is shown in the viewfinder.

Setting Time Values

The camcorder uses three types of time values: counter values, time code values, and user bits. The time value is displayed in the viewfinder screen and in the display window.



Use the DISPLAY switch to switch time value indications.

Type of time value	DISPLAY switch setting
Counter of tape transport time	COUNTER
Time code	TC
User bits	U-BIT

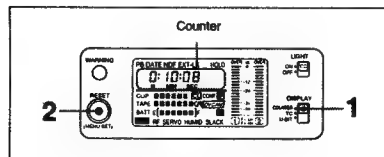
Note

The time code and user bits cannot be displayed properly if the tape does not have time code and/or user bits recordings or if the time code was recorded using a non-compatible method.

For details of the time value indication in the viewfinder, see page 76.

Resetting the counter

The counter value shows the tape's running time in hours, minutes, and seconds format. Before starting a tape, perform the following steps to reset the counter.



- 1 Set the DISPLAY switch to COUNTER.

The time value indication in the display window shows the current counter value.

- 2 Press the RESET/(MENU SET) button.

This resets the counter shown in the viewfinder and display window as "0:00:00".

The counter value starts advancing as the tape is transported. It shows negative values if the tape is rewound past the point where the counter was reset.

Note

Discontinuous recording in the tape may cause the counter to malfunction during playback.

Displaying the date/time

The camcorder automatically records the real time of the built-in clock on the tape in addition to time codes and video/audio signals.

Perform the following steps to display the date or time instead of the time value.

- 1 Confirm the following.

Parts to confirm	State
Display window	The VCR menu is not displayed.
TC mode switch 1/2	Set to the position other than PRESET/SET.

- 2 Set the DISPLAY switch to TC or U-BIT.

- 3 Press the SHIFT button.

While pressing the SHIFT button, the date or time is displayed at the location of the time value indication.

DISPLAY switch setting	Indication
TC	Time
U-BIT	Date

For description of how to set the built-in clock, see "Menu 101 Setting the Real Time Clock and Calendar" on page 105.

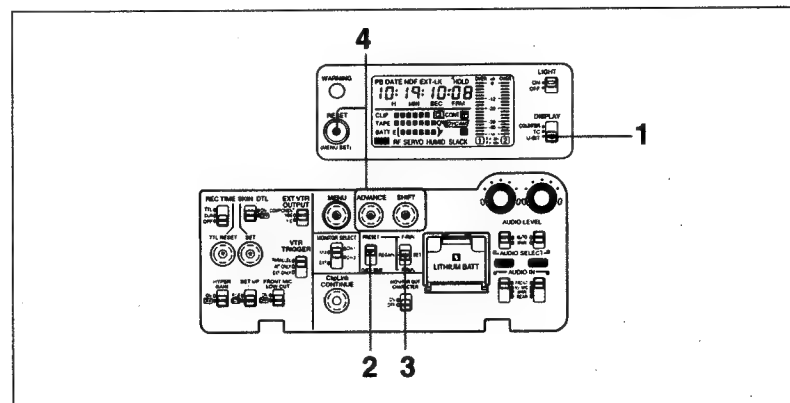
Setting the User Bit Value

You can set the user bits as eight-digit hexadecimal values (base 16) to have the date, time, scene number, and other information inserted into the time code.

When using both the time code and user bits, set up the user bits first. If you set the time code first, the internal time code generator will remain stopped while you set the user bits, which will set the time value off from the original setting.

Note

Setting the user bit value may be disallowed in some cases at ClipLink shooting. For details, see step 4 on page 69 in "ClipLink Shooting".



- 1 Set the DISPLAY switch to U-BIT.

The user bits indication appears.

- 2 Set the TC mode switch 1 to PRESET.

- 3 Set the TC mode switch 2 to SET.

This causes the leftmost digit in the user bits indication to start blinking.

- 4 Set the user bits.

Operation	Step
Select a digit	Press the SHIFT button. Each time you press the SHIFT button, the next digit to the right starts blinking.
Change a value	Press the ADVANCE button. Each time you press the ADVANCE button, the displayed value is incremented to F and returns to 0.
Reset	Press the RESET/(MENU SET) button. The display returns to "00 00 00 00".

Hexadecimal digits A to F are displayed as follows.

Hexadecimal digit	A	B	C	D	E	F
Display	A	b	c	d	e	f

- 5 Perform step 6 in "Setting the Time Code Value" on page 65.

Setting Time Values

Setting the Time Code Value

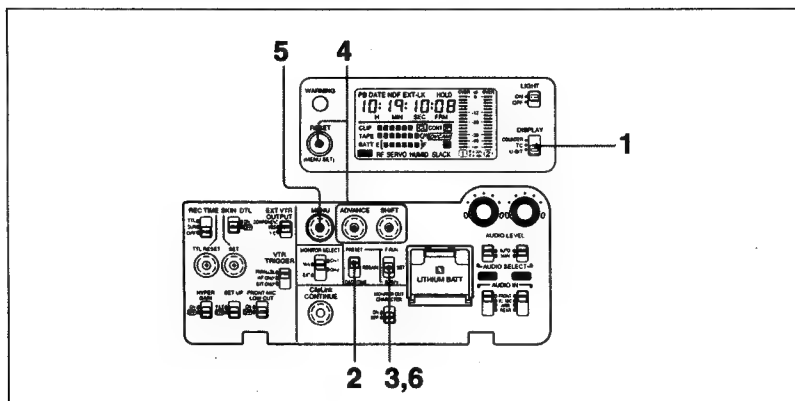
This section describes the steps for setting time code recording methods for particular shooting conditions and setting initial values.

When using both the time code and user bits, **set up the user bits first**. If you set the time code first, the internal time code generator will remain stopped while you set the user bits, which will set the time value off from the original setting.

For details of setting user bits, see "Setting the User Bit Value" on previous page.

Note

Setting the time code value may be disallowed in some cases at ClipLink shooting. For details, see step 4 on page 69 in "ClipLink Shooting".



- 1 Set the DISPLAY switch to TC.
- 2 Set the TC mode switch 1 to PRESET.
- 3 Set the TC mode switch 2 to SET.

This causes the leftmost digit in the time code display to start blinking.

- 4 Set the time code initial value.

Operation	Step
Select a digit	Press the SHIFT button. Each time you press the SHIFT button, the next digit to the right starts blinking.
Change a value	Press the ADVANCE button. Each time you press the ADVANCE button, the displayed value increases.
Reset	Press the RESET/MENU SET button. The display returns to "00:00:00.00".

The time code value can be set anywhere in the range of "00:00:00:00" to "23:59:59:29" (DSR-500WS) or "23:59:59:24" (DSR-500WSP).

- 5 For the DSR-500WS, use menu 204 to select the frame mode.

Operation	Step
Adjust the discrepancy between time code value and real time	Select the drop-frame mode.
Need not adjust the discrepancy between time code value and real time	Select the non-drop-frame mode.

For more information about the drop-frame/non-drop-frame mode, see "Drop-frame mode (for DSR-500WS Only)" on next page.

For details of menu operations, see page 105.

- 6 Use the TC mode switch 2 to set the desired running mode.

Operation	Setting
Time code advances freely regardless of the VCR's current operation mode.	F-RUN
Time code value advances only while recording.	R-RUN

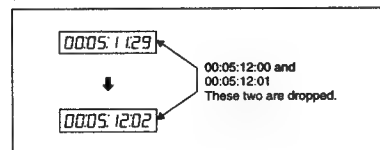
If you select F-RUN, the time code starts advancing immediately.

Drop-frame mode (for DSR-500WS only)

In the NTSC standard, the time code value is based on 30 frames per second, but the exact video frame frequency is in fact 29.97 frames per second and the real time, or 18 frames per 10 minutes.

Drop-frame mode corrects for this by skipping two frame counts at the beginning of every minute which is not a multiple of ten.

Example: When the minute value is changing from 11 to 12



In **non-drop-frame mode**, however, no frame counts are omitted, and there is a gradual deviation of the time code from real time.

Making the time code continuous at back space editing

Set the TC mode switch 2 to R-RUN and start back space editing.

For operation of back space editing, see "Back Space Editing" on page 58.

Restarting an interrupted recording

Perform the following steps to make the time code continuous when the recording has been interrupted or when the cassette tape has been removed from the camcorder between shootings.

- 1 Set the TC mode switch 1 to REGEN.

Time code advance is automatically set to R-RUN even if the TC mode switch 2 has been set to F-RUN.

- 2 Perform steps 1 to 6 of "Starting Back Space Editing at Any Tape Position" on pages 58 and 59.

When the camcorder is at the recording pause state, the recorded time code is read from the tape and synchronized to the internal time code generator.

- 3 Press the VTR button on the camcorder or lens to restart back space editing.

Setting the time code to the real time clock and calendar

Set the TC mode switch 1 to DATE/TIME.

You can record the real time set in menu 101 as the time cord, and the calendar set in menu 101 as the user bits.

Once you set this switch to DATE/TIME position, it is not possible to retrieve the previous value (user bits and time code) in the time code generator.

For how to set the real time clock and calendar, see "Menu 101 Setting the Real Time Clock and Calendar" on page 105.

Setting Time Values

Synchronization With External Time Code Signals — Gen-Lock

To edit and compile a recording that is shot using multiple camcorders, it is necessary to synchronize the video and time code of the various camcorders (by gen-lock).

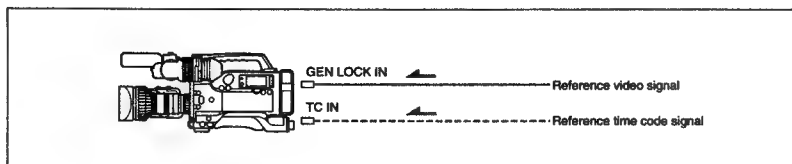
Note

Synchronization with external time code signals (by gen-lock) may be disallowed in some cases at ClipLink shooting. For details, see step 4 on page 69 in "ClipLink Shooting"

Connection for gen-lock

Connect the reference video and time code signals to the camcorder as shown below.

Locking the video and time code signals to an external reference signal

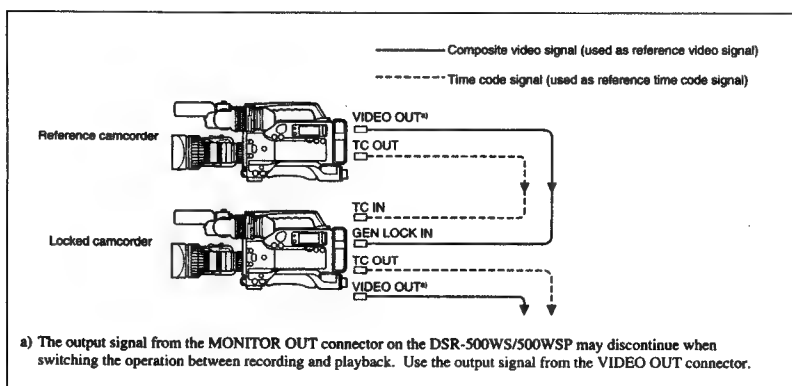


Locking the video and time code signals to another camcorder's video and time code signals

Using one camcorder as reference, to its video and time code signals, lock the other camcorders' video

and time code signals.

If the reference camcorder is gen-locked to an external reference signal, any other connected camcorders are gen-locked to the same reference signal.



Locking the internal time code generator to the reference time code

Perform the following steps to synchronize the camcorder's internal time code generator to an external time code.

- 1 Set the TC mode switch 1 to PRESET.
- 2 Set the TC mode switch 2 to F-RUN.
- 3 Connect a reference time code and video signal to the camcorder.

For connections, see the previous section "Connection for gen-lock".

"EXT-LK" will be displayed in the display window. The internal time code generator will maintain its externally synchronized state even after you disconnect the reference time code signal. The precision of this synchronization (phase alignment) of time codes depends on the precision of the camcorder's sync signal generator.

Notes

- After setting up external synchronization, allow a few seconds for the camcorder's sync signal generator to stabilize before recording.
- Only the time code can be externally synchronized. User bits cannot be externally synchronized.
- If you turn the POWER switch on or off while the camcorder is operating under external synchronization, synchronization precision will be reduced.

ClipLink Shooting

The ClipLink function is intended to be used at various stages from recording to editing. When you record using this function, Index Pictures are automatically recorded along with the time code, scene number, and other data, all of which make for more efficient editing.

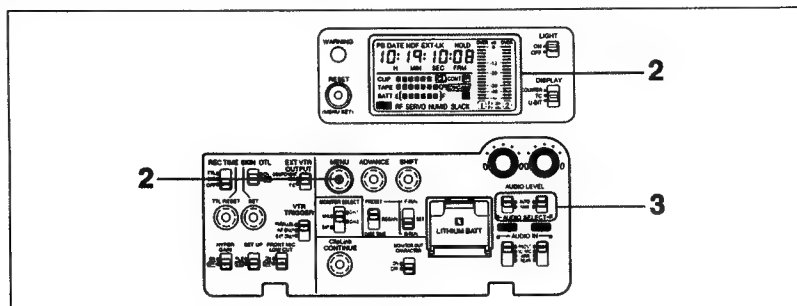
For an overview of the ClipLink function, see "What Is ClipLink?" on page 136.

To record Index Picture, the optional DSBK-301A Index Picture Board is required.

For detail of fitting the optional DSBK-301A, refer to the instruction manual supplied with it.

Notes

- When an external equipment, such as VCR, is connected to the DV OUT connector, you cannot shoot with ClipLink.
- On the DSR-500WS/500WSP, you can also use the ClipLink function without recording Index Pictures. However, if you perform ClipLink shooting on the DSR-500WS/500WSP without fitting the optional DSBK-301A, the recorded tape may cause malfunction at ClipLink continue on the DSR-1/1P. When you perform ClipLink shooting in a system containing the DSR-1/1P and DSR-500WS/500WSP, fit the optional DSBK-301A Index Picture Board to the DSR-500WS/500WSP.



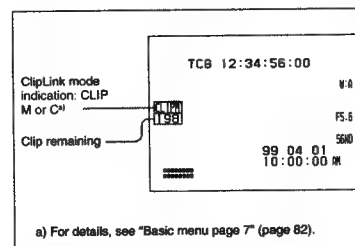
- 1 Turn the power on and perform steps 2 to 10 in "Basic Procedure for Shooting" (pages 49 and 50).
- 2 Perform the first two steps (page 53) in "Recording on the Internal VCR". Check the following points.

Check point	Method
Check the ClipLink function is on (or set it to on).	See "Menu 211 Selecting the ClipLink Function" under "VCR Menu Operation" (page 109).
Check whether or not the cassette includes cassette memory. (The camcorder supports cassettes with up to 16 Kbits of cassette memory.)	CLIP appears in the display window when the loaded cassette includes cassette memory. (The ClipLink function cannot be used unless CLIP appears in the display window.)
Make sure that the lithium battery has been correctly inserted and is not used up.	IP appears in the display window if the lithium battery has not been inserted or is used up.

CLIP and **IP** appear in the display window.

Display	Meaning
CLIP	The camcorder is in ClipLink mode.
IP	The camcorder is in ClipLink mode and can record Index Pictures (when the DSBK-301A is fitted).

The following display appears on the viewfinder screen.



To record the cassette name/number
Access basic menu page 7 to specify a name or number for the inserted cassette (see page 82).

Notes

- If you use a cassette that contains data recorded via a different VCR, when you enter a cassette name/number in the cassette memory, you may lose any data that was previously written to the cassette memory. Also, if you use a cassette that contains data recorded in ClipLink mode on the camcorder for recording on a different VCR, you may lose any data that was previously written to the cassette memory.
- When you power the camcorder or insert a cassette, black squares (■) blink in the place of the clip remaining indication in the display window (during this, the cassette memory data is being checked). Start recording after the blinking ends, or the ClipLink function will be disabled.
- When **CLIP** appears in the display window, it means that data has already been recorded into the cassette memory. If you record under this condition whether the ClipLink function is available or not, the existing cassette memory data will be overwritten. To avoid this, you can either insert a new cassette or follow the procedure for appending cassette memory data, as described in the section "Resuming Recording in ClipLink Mode" (page 72). If the **CLIP** is flashing, it means abnormality of the cassette memory. In this case, it is impossible to continue recording from that data on ClipLink mode.
- The number of recordable clips varies with cassette memory capacity. Up to 45 clips (Index Pictures) can be recorded in a 4-Kbit cassette

memory and up to 198 clips (Index Pictures) can be recorded in a 16-Kbit cassette memory.

- 3 Set the AUDIO SELECT (CH-1/CH-2) switch to AUTO or MAN (see page 54).
- 4 Press the VTR button on the camcorder or the lens.

Recording begins when the TALLY indicator stays lit after blinking for a moment. The camcorder enters ClipLink continue mode (in which back space editing is possible using ClipLink function) and indication **CONT** appears in the display window.

During recording, the time code (HH:MM:SS format) at the recording start (Rec IN) point is recorded into the camcorder's internal memory. Index Pictures are also recorded if you use the DSBK-301A.

Note

When **CONT** appears, regardless of the setting of the TC mode switch 1, the time code generator automatically enters REGEN mode. Consequently, you cannot freely specify a time code nor can you use the external synchronization (genlock) function.

- 5 To stop recording, press the VTR button on the camcorder or the lens.

This sets recording pause mode.

The time codes (HH:MM:SS) for the current clip (contents between the Rec IN and Rec OUT points) are recorded along with the scene number (as scene 001) in the cassette memory. The last Index Picture in the recorded scene is also recorded when the DSBK-301A is fitted.

Note

While data is being recorded in the cassette memory, cutting the power supply or opening the cassette holder is disallowed. If you turn the POWER switch off or press the EJECT button, black squares (■) blink in the place of the clip remaining indication in the display window. When the data has been recorded, the power supply is cut or the cassette is ejected.

(Continued)

ClipLink Shooting

To continuously record the next scene


Repeat steps 4 and 5.

The scene number will be automatically incremented from the previous number.

You can set or clear an "NG" designation for the previously recorded scene before shooting the next scene.

If you have stopped the recording, see "Resuming Recording in ClipLink Mode" (page 72).

Notes

• During recording pause, pressing the STOP/PLAY/FWD/REW buttons, performing edit search, or ejecting the cassette will interrupt the ClipLink shooting. With this state, it is impossible to start back space editing using ClipLink function. (The ClipLink continue mode is canceled and indication  in the display window disappears.)

To perform back space editing at the recording stop position, press the ClipLink CONTINUE button before resuming recording. If you do resume recording without pressing this button first, the previous recorded data (and Index Pictures) will be overwritten or otherwise invalidated.

• Each time you press the STOP button, the number of remaining clips is decremented by one. If you resume recording with the same VCR, the number of remaining clips is automatically incremented by one.

For details, see "Resuming Recording in ClipLink Mode" (page 72).

• Do not unplug the power supply connector (connected to a battery pack or AC outlet) while the POWER switch is still set to ON, as this may cause the ClipLink function to operate abnormally. Be sure to set the POWER switch to OFF before disconnecting the power supply.

Setting Editing Points While Shooting

You can use the TAKE button to record a time code for a Cue point or a Mark IN/OUT point.

Setting Mark IN/OUT points as you shoot

The following data is recorded onto the cassette when you specify Mark IN/OUT points while shooting continuously at length, instead of during linked recording of each scene.

- Time codes (HH:MM:SS) for specified Mark IN/OUT points
- Scene number: The scene number counter is automatically incremented with each Mark IN point specification.
- NG specification, cassette name/number
- Index Pictures for all Mark IN points (when the DSBK-301A is fitted): these are recorded each time recording is stopped.

Note

The time codes for Rec IN/OUT points are not recorded.

Perform the following procedure.

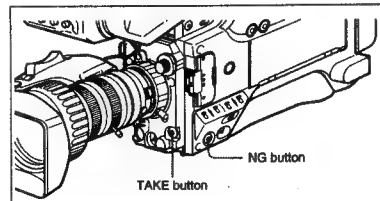
- 1 Perform steps 1 to 3 in "ClipLink Shooting" (pages 68 and 69).
- 2 Access basic menu page 7 and perform the following operations.
 - 1) Set MARK/CUE to MARK.
 - The ClipLink mode indication "CLIP M" appears on the viewfinder screen.
 - 2) Set the cassette name or number if necessary.

For details of menu operations, see "Basic Menu Operations" (page 80).

- 3 Press the VTR button on the camcorder or lens.

The camcorder starts recording, and the REC/TALLY indicator(s) light(s) in the viewfinder.

- 4 Press the TAKE button when you find a shot where you would like to set a Mark IN point.



The TAKE/TALLY indicator (orange) lights in the viewfinder and "TAKE" appears on the screen.

- 5 Press the TAKE button when you find a shot where you would like to set a Mark OUT point.

The TAKE/TALLY indicator (orange) goes out in the viewfinder and the "TAKE" disappears from the screen.

At this time, the time code (HH:MM:SS) at the Mark IN/OUT point for scene 001 is recorded to the camcorder's internal memory, and then recorded to the cassette memory.

To set/clear NG

If you press the NG button before you set the next Mark IN point, the previous scene will be designated as "NG" ("NG" appears on the viewfinder screen or the screen).

Once NG has been set, you can cancel it by pressing the NG button again before you set the next Mark IN point (the "NG" on the screen disappears).

- 6 Repeat steps 4 and 5 as needed to record time codes at Mark IN/OUT points, scene numbers, and NG designations to cassette memory.

The scene number is automatically incremented each time you specify a Mark IN point.

- 7 To finish shooting, press the VTR button on the camcorder or the lens.

This stops the recording operation.

The Index Pictures of each Mark IN point are recorded onto the tape (when the DSBK-301A is fitted).

Setting Cue points as you shoot

The following data is recorded onto the cassette when you specify a Cue point to highlight a scene.

- Time codes (HH:MM:SS) for Rec IN/OUT points
- Time codes (HH:MM:SS:frame) for Cue points
- Scene number: The scene number is automatically incremented with each Rec IN point specification.
- NG designation, cassette name/number (if set from the camcorder)
- Index Pictures for all Rec IN points (when the DSBK-301A is fitted): these are recorded each time recording is stopped.

Perform the following procedure.

- 1 Perform steps 1 to 3 in "ClipLink Shooting" (pages 68 and 69).
- 2 Access basic menu page 7 and perform the following operations.
 - 1) Set MARK/CUE to CUE.
 - The ClipLink mode indication "CLIP C" appears on the viewfinder screen.
 - 2) Set the cassette name or number if necessary.

For details of menu operations, see "Basic Menu Operations" (page 80).

- 3 Press the VTR button on the camcorder or the lens.

The camcorder starts recording, and the REC/TALLY indicator lights in the viewfinder.

- 4 Press the TAKE button when you find a shot where you would like to set a Cue point.

The "CUE" indication appears (for about 1 second) on the viewfinder screen. At this point, the time code (HH:MM:SS:frame) at the Cue point is recorded into the cassette memory.

- 5 Repeat step 4 to specify more Cue points.

ClipLink Shooting

- 6** To finish shooting, press the VTR button on the camcorder or the lens.

This stops recording operation.

Time codes (HH:MM:SS) of recording start/stop points (Rec IN/OUT points) and scene number (scene 001) are recorded to the cassette memory and the Index Picture of the Rec IN point is recorded onto the tape (when the DSBK-301A is fitted).

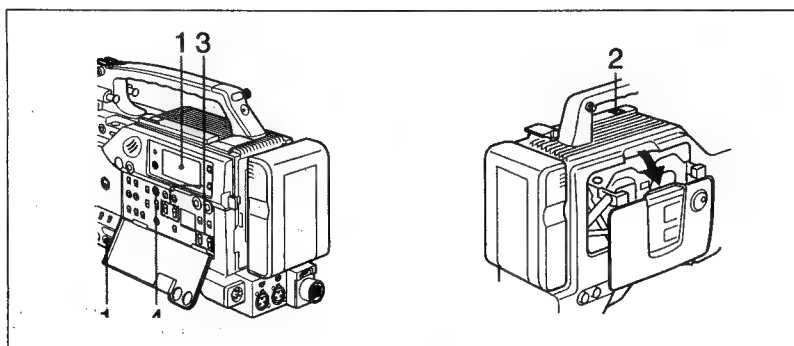
Resuming Recording in ClipLink Mode

During recording pause in ClipLink mode, pressing the STOP/PLAY/F FWD/REW buttons, performing edit search, or ejecting the cassette will interrupt the ClipLink shooting. With this state, it is impossible to start back space editing using ClipLink function. (The ClipLink continue mode is canceled and indication CONT in the display window disappears.) If you resume recording on the same cassette, the previously recorded data will be overwritten.

You can avoid this and continue recording in ClipLink mode from the previous recording stop point by performing the following steps.

Note

If you stop recording during the first ten seconds of recording, you may not be able to use these steps to continue recording in ClipLink mode.



- 1** Perform steps **2** to **10** in "Basic Procedure for Shooting" (pages 49 and 50) and step **1** (page 53) in "Recording on the Internal VCR".

- 2** Insert a cassette if one is not already loaded.

The and indications should appear in the display window.

Note

If the is flashing, it means abnormality of the cassette memory. In this case, it is impossible to continue recording from that data on ClipLink mode.

- 3** Check the following points.

Check point	Result and response
CLIP and (when the DSBK-301A is fitted) appear in the display window	If these indications do not appear in the display window, access the VCR menu and set ClipLink function to on (see page 109).
Remaining clips	Make sure there are enough capacity for recording clips (see page 18).

- 4** Press the ClipLink CONTINUE button.

The tape remaining indication in the display window flashes as the camcorder automatically searches the recording stop point. When it finds the recording stop point, it stops and enters recording pause mode. Once it has stopped, check that the **CONT** indication appears in the display window.

To find the recording stop point efficiently

If you press the ClipLink CONTINUE button after rewinding or fast forwarding the tape to the position between the previous recording's start point and stop points, the recording stop point can more efficiently be found via an automatic search function.

If the recording stop point cannot be found, the **CONT** indication flashes in the display window.

- 5** Press the VTR button on the camcorder or the lens.

This starts the recording function.

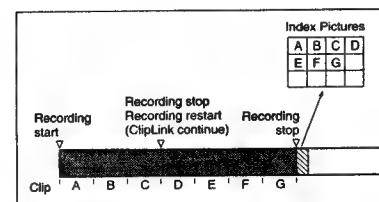
- 6** When the recording is finished, set recording pause mode (or specify a Mark OUT point).

The time code (HH:MM:SS), scene number (serial number of scene during which recording was stopped) and other data for the current clip (contents between the Rec IN and Rec OUT points or between Mark IN and Mark OUT points) are recorded into cassette memory. The Index Pictures for the recorded scene are recorded after the recorded scene when the DSBK-301A is fitted.

Repeat steps **5** and **6** to start recording the next scene.

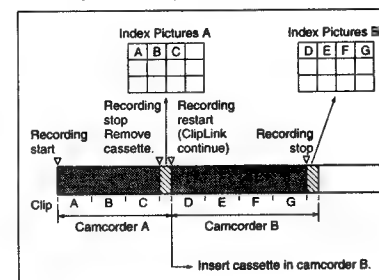
The Index Pictures are recorded onto the tape as described below when the DSBK-301A is fitted.

When all Index Pictures are recorded at the end of the recordings



When two or more series of Index Pictures are separately recorded

Two or more series of Index Pictures may be recorded if ClipLink shooting is once interrupted due to ejecting the cassette and resumed (in case of changing the camcorder on resuming, for example).



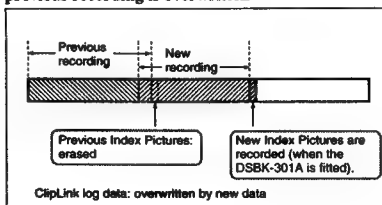
If there is no need for ClipLink continue

It is not necessary to press the ClipLink CONTINUE button when restarting recording. See step 4 in the previous section "Resuming Recording in ClipLink Mode".

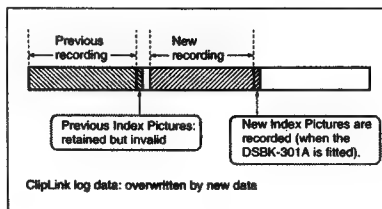
The contents recorded on the cassette may differ in this case depending on the settings when the recording is restarted.

ClipLink Shooting

When recording in ClipLink mode is started and previous recording is overwritten



When recording in ClipLink mode is started after a previous recording



Viewfinder Screen Indications

There are four types of indication screen which appear in the viewfinder, as follows.

- Normal indications

These show the operating state of the camcorder. (See page 76.)

- Status indications

Pressing the MENU switch up while the normal indications are present calls a display of current settings. (See page 79.)

- Basic menu

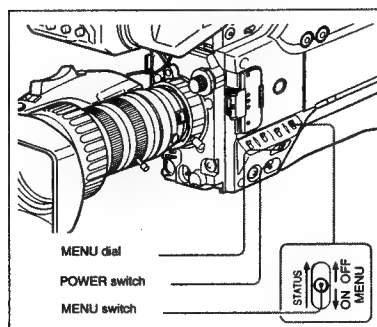
This provides settings for the lens iris, shutter speed and so forth, and also a titling screen. (See the section "Viewfinder Basic Menu" on pages 80 to 85.)

- Advanced menu

This provides settings for the center marker, zebra pattern, viewfinder screen indications, and so forth. (See the section "Viewfinder Advanced Menu" on pages 86 to 92.)

Changing the Viewfinder Display

Use the dial and switches shown in the following figure to switch the viewfinder display among the normal indications, basic menu pages and advanced menu pages.

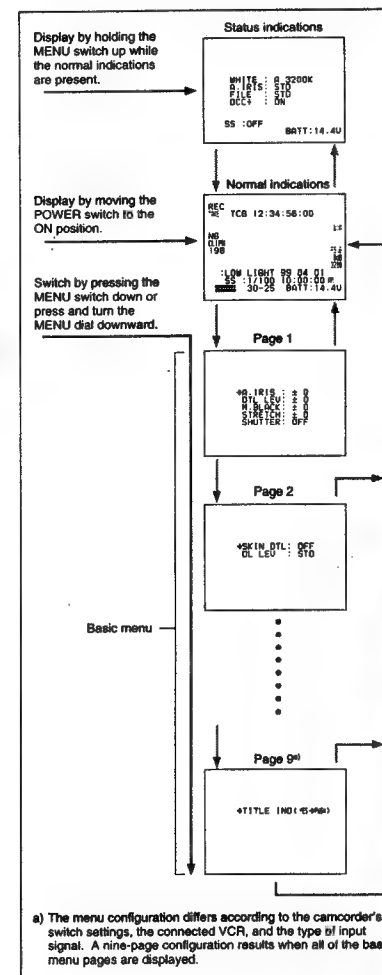


Displaying the normal indications and switching to the basic menu

To display the normal indications, move the POWER switch to the ON position.

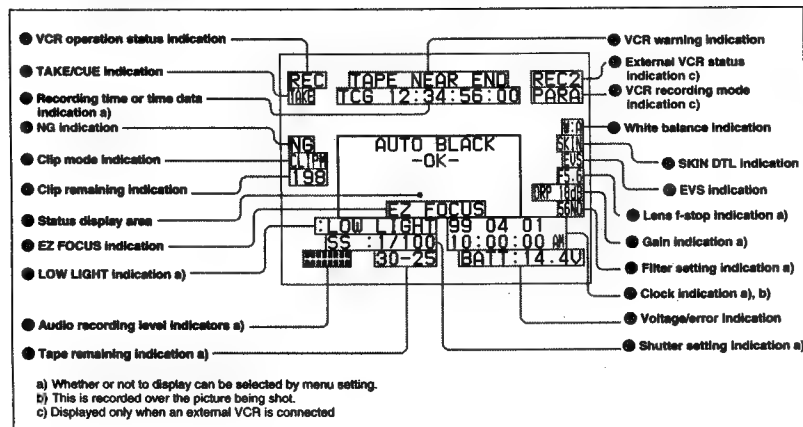
To switch to and from the basic menu, use the MENU switch or MENU dial.

"CHECK DIAG" appears before basic menu page 1 when the self diagnostic function has detected an abnormality. (see page 85.)



Viewfinder Normal Indications

During normal operation, the following items can be indicated in the viewfinder.



The significance of each of the indications shown in the figure is as follows.

1 VCR operation status indication

This indicates the VCR's current operation status (REC, PLAY, etc.).

2 TAKE/CUE indication

This displays a TAKE or CUE indication when using the ClipLink function for recording.

TAKE: When recording in Mark mode, this indication appears when a Mark IN point is set and disappears when the next Mark OUT point is set.

CUE: When recording in Cue mode, this indication appears for about 1 second when a Cue point is set.

3 Recording time or time data indication

This shows the following values.

- When the REC TIME switch is in the TTL position: The total recording time. (When an external VCR is connected, you can select whether to show the recording time of the internal VCR or of the external VCR using advanced menu page 4. See page 89 for more information.)

- When the REC TIME switch is in the DUR position: The duration of the current recording cut.
- When the REC TIME switch is in the OFF position and the item TC IND in advanced menu page 6 is set to "ON": A time data value depending on the DISPLAY switch settings as shown in the following table.

DISPLAY switch setting	Time data displayed
COUNTER	CNT: Tape transport time
TC	TCG: a time code from the time code generator TCR: a time code from the time code reader
U-BIT	UBG: a user bit value from the time code generator UBR: a user bit value from the time code reader

Time data values appear during playback, fast forward, rewind, or recording review.

4 NG indication

An "NG" (No Good) indication appears if you designate a recorded scene as "NG" when using the ClipLink function for recording.

5 Clip mode indication

A "CLIP M" or "CLIP C" indication appears when you use the ClipLink function for recording.

CLIP M: Indicates shooting in Mark mode

CLIP C: Indicates shooting in Cue mode

6 Clip remaining indication

The number of available clips is displayed when you use the ClipLink function for recording.

7 Status display area

One of the following values or messages is displayed to indicate the camcorder's current status or its operation status.

- New values when changing camcorder's settings
- Messages indicating progress or results of adjustments
- The camcorder's current settings
- SetupLog data recorded to a tape during shooting (see page 101)

8 EZ FOCUS indication

This appears when the EZ FOCUS button is pressed, enabling the "easy focus" function.

Note

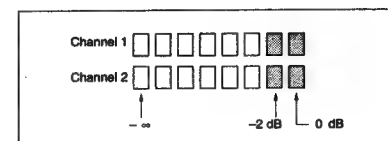
The status indication is not shown while this indication appears.

9 LOW LIGHT indication

This warning appears if the lighting level is inadequate.

10 Audio recording level indicators

These show the recording levels of audio channels 1 and 2.



11 Tape remaining indication

This shows the tape remaining as follows.

Indication	Tape remaining
F-30	At least 30 minutes
30-25	25 - 30 minutes
25-20	20 - 25 minutes
20-15	15 - 20 minutes
15-10	10 - 15 minutes
10-5	5 - 10 minutes
5-0	2 - 5 minutes
5-0 (flashing)	0 - 2 minutes

12 VCR warning indication

This shows warning indications about operation or status of the VCR.

Indication	Meaning
NO TAPE	There is no tape loaded.
REC INHIBIT	The tape is in the recording inhibited state.
LOW BATT	The battery is almost exhausted.
BATT END	The battery is exhausted.
TAPE NEAR END	The tape is near the end.
TAPE END	The tape is at the end.
SERVO	The servo lock has been lost.
HUMID	There is condensation.
RF	The video heads are clogged, or there is some other fault in the recording system.
SLACK	The tape is not wound properly.
MP TAPE	An incorrect type of cassette has been loaded. (The cassette is automatically ejected and the indication disappears in about two seconds.)
CLIP DATA ERR	Abnormality of ClipLink log data in the cassette memory data.
AUDIO 48kHz? (4 flashes/s)	At back space editing, you are switching from 32 kHz audio recording mode (4-channel mode) to 48 kHz audio recording mode (2-channel mode).
AUDIO 32kHz? (4 flashes/s)	At back space editing, you are switching from 48 kHz audio recording mode (2-channel mode) to 32 kHz audio recording mode (4-channel mode).
ERROR:91-13F	Failure in loading or saving the cassette memory data.

(Continued)

Viewfinder Normal Indications

Indication	Meaning
CLIP CONT?	Asking whether you will continue shooting in ClipLink mode or not when the cassette contains ClipLink data. (The indication disappears when you press the ClipLink CONTINUE button or start the next shooting without pressing it.)
CLIP NEAR END	At ClipLink shooting, capacity for only 1 to 3 clips remains.
CLIP END	Impossible to record any more clip shots.

Note

If the message appears other than above, contact your Sony dealer.

- ⑫ **External VCR (connected to the VTR connector (26-pin)) status indication (when an external VCR is connected)**

Shows the external VCR operation status.

- ⑬ **VCR (connected to the VTR connector (26-pin)) recording mode indication (when an external VCR is connected)**

Shows recording mode of the internal and external VCRs set by the VTR TRIGGER switch.

Indication	Meaning
PARA	Simultaneous recording of the internal and external VCRs
INT	Recording on the internal VCR
EXT	Recording on the external VCR

- ⑭ **White balance indication**

The following indications appear.

Indication	Meaning
EZ	Operating in EZ mode (The ATW function is selected.)
ATW	The ATW function is selected (The ATW button was pressed and the indication is lit.)
W:A	White balance memory A is selected.
W:B	White balance memory B is selected.
W:P	Preset white balance is selected.
W:M	Manual adjustment is performed remotely.

- ⑮ **SKIN DTL indication**

This appears when the skin detail function is activated (The SKIN DTL switch is set ON.)

- ⑯ **EVS indication**

This appears when the EVS (Enhanced Vertical definition System) function is enabled. (See page 116.)

- ⑰ **Lens f-stop indication**

This shows the f-stop of the lens.

Note

Depending on the lens being used, this indication may differ slightly from the actual f-stop on the lens.

- ⑱ **Gain indication**

This shows the gain value, and the settings of the HYPER GAIN switch (see page 88) and the DPR (Dual Pixel Readout) function as shown in the following table.

Example indication	Meaning
18 dB	Gain setting is 18 dB.
DPR 18 dB	The DPR function is enabled. In this case the DPR function approximately doubles the gain (an increase of 6 dB) over the current gain setting (in this case 18 dB).
HYPER	The HYPER GAIN switch is in the ON position. In this case the hyper gain function increases the gain by a factor of about 60 with respect to 0 dB regardless of the current gain setting (that is, increased to 36 dB).

- ⑲ **Filter setting indication**

This shows the setting of the FILTER control.

Indication	Filter setting
3200 ^a	1 (3200K)
56ND	2 (5600K + 1/4ND)
5600	3 (5600K)
56ND	4 (5600K + 1/4ND)

a) When "3000" is selected in advanced menu page 3 (page 88), "3000" is displayed.

- ⑳ **Clock indication**

The clock indication is shown in one of the following ways (according to the CLOCK IND setting of OFF, CAM, or BARS in advanced menu page 8). (See page 91.)

OFF: Not displayed.

CAM: Always displayed.

BARS: Displayed whenever color bars are displayed.

If the clock indication is displayed during recording, it is recorded onto the image.

- ㉑ **Voltage/error indication**

The current voltage is displayed whenever the power supply voltage dips below 11.3 V DC. However, you can also display the current voltage at any time by pressing and holding the MENU switch in the upward position (the display is shown for as long as you hold the switch upward).

An error message is displayed when an abnormality has been detected by the auto diagnostic function (page 85).

If an error message appears, contact your Sony dealer.

- ㉒ **If using an Anton Bauer Intelligent Battery System**

The remaining battery capacity is shown as a percentage.

- ㉓ **Shutter setting indication**

When the SHUTTER switch has been set to ON, the shutter speed, EVS indication, or CLS frequency set in the basic menu page 1 is displayed here.

Status Indications

If you set the MENU switch to STATUS while a menu is being displayed, the camcorder's current setting status will be shown in this display area.

WHITE	: A 3200K
A.I.RIS	: STD
FILE	: STD
DCC+	: DEF ^{a)}
SS	: OFF
BATT	: 14.4U

a) When both the DCC+ and DynaLatitude functions are set to OFF

Display	Description
WHITE	White balance adjustment method selection (PRE/A/B) and color temperature during auto white balance adjustment
A.IRIS	Iris adjustment method selection (STD/SPOT L/BACK L)
SETUP FILE	Setting of the SETUP switch (page 22)
DCC+ or DL	For DCC+ indication: ON with the OUTPUT/DL/DCC+ switch set to CAM/DCC+ (DCC+ ON), and OFF with the switch set to CAM/DL and DL in advanced menu page 2 (page 88) set to OFF (both DCC+ and DynaLatitude OFF). For DL indication: When setting the OUTPUT/DL/DCC+ switch to DL and DL in advanced menu page 2 to OFF (DynaLatitude OFF), LOW, STD or HIGH is displayed according to DL LEV setting in basic menu page 2 (page 81).

Note

Status indicators will not be displayed during EZ mode.

Viewfinder Basic Menu

To display the basic menu pages, press the MENU switch downward (to ON position) or press the MENU dial while the normal indications are being shown in the viewfinder. The basic menu configuration can include up to nine pages. (The configuration depends on the switch settings.)

Basic Menu Operations

The common operations on all basic menu pages are described below.

To change the page or item

The cursor is moved downward each time you press the MENU switch down. Once the cursor has reached the last item on a page, press down the MENU switch to go to the next page. When the last page is being displayed, pressing down the MENU switch returns the display to the normal indications.

The cursor is moved upward each time you press up the MENU switch. Once the cursor has reached the first item on a page, pressing up the MENU switch returns the display to the normal indications. The cursor starts blinking when you press the MENU dial. In this state, you can change the page or item by turning the MENU dial.

To change settings

Align the cursor to the desired item using the MENU switch and turn the MENU dial. You can change settings only with the MENU dial. Press and turn the MENU dial to align the cursor to the desired item and press the MENU dial. To reset any item to its shipped settings, press the MENU dial for 2 seconds.

Contents and Settings of Each Menu Page

Each page's contents and settings are described below.

Basic menu page 1

```

+0. IRIS : ± 0
DTL LEV : ± 0
M. BLACK : ± 0
STRETCH : ± 0
SHUTTER : OFF
  
```

Item	Settings
A. IRIS Sets a base value for auto adjustment of lens iris.	-1.0, -0.5, ±0 (normal value), +0.5, +1.0 Negative adjustment values set a narrower lens iris and positive values set a wider lens iris.
DTL LEV Sets the detail (edge) emphasis.	-99 to ±0 (normal value) to +99 Negative adjustment values soften the image's edges and positive values sharpen them.
M. BLACK Sets the master pedestal level.	-99 to ±0 (normal value) to +99 Negative adjustment values make dark areas of the picture darker and increase the contrast. Positive adjustment values dark areas of the picture lighter and reduce the contrast.
STRETCH Sets black stretch/compress value.	-15 to ±0 (normal value) to +15 This function adjusts the intensity of dark areas of the screen. Negative values make these areas darker (black compress) and positive values make these areas brighter (black stretch).
SHUTTER Sets shutter speed or CLS/EVS setting. (see page 116.)	DSR-500WS: 1/100 (normal value), 1/250, 1/500, 1/1000, 1/2000, EVS, CLS (60.4 Hz to 200.3 Hz) DSR-500WSP: 1/60 (normal value), 1/250, 1/500, 1/1000, 1/2000, EVS, CLS (50.3 Hz to 201.4 Hz) This selects either the shutter speed, the scan frequency, or EVS for the clear scan function. When the SHUTTER switch is set to OFF, this item cannot be set.

If you set MENU MODE to 2 on the advanced menu page 9, the menu for selecting the 16:9/4:3 mode is added before the basic menu page 1.

Basic menu page 2

```

+SKIN DTL : OFF
DL LEV : STD
  
```

Item	Settings
SKIN DTL Sets the amount of skin detail correction.	0.0 to 0.5 (normal value) to 1.0 Smaller values set a softer skin detail.
DL LEV Sets the DynaLatitude level.	LOW, STD (normal value), HIGH Set the amount of DynaLatitude effects as high level, standard level (STD), or low level.

Basic menu page 3

This is displayed when the SETUP switch has been set to FILE.

```

FILE: #F
+SELECT F FILE
H: 001
CHG FILE
(YES+PUSH)
  
```

For details of this operation, see "Setup Files" (page 94).

Basic menu page 4

This is displayed when the optional DSBK-501/501P Analog Composite Input Board is fitted to the camcorder.

```

+VIDEO IN: CAM
  
```

Item	Settings
VIDEO IN Selects the signal to be recorded onto the internal VCR.	CAM (normal value) Records the signal shot by this camcorder. EXT Records the signal input from the GEN LOCK IN/VIDEO IN connector. The image on the viewfinder and the signal output from the MONITOR OUT connector are switched to the external video signal. When inputting the external video signal, "EXT INPUT" blinks on the screen.

EXT INPUT

If you set VIDEO IN to EXT and input the external VBS signal from the GEN LOCK IN connector, the image in the viewfinder and the signal output from the MONITOR OUT connector are switched to the external video signal. When inputting the external video signal, "EXT INPUT" always blinks on the screen.

Notes

- When VIDEO IN is set to EXT, the video signals are not output from the S VIDEO OUT connector.
- When VIDEO IN is set to EXT, the basic menu page 5 is not displayed.

Basic menu page 5

This menu is displayed when CAM is selected on the basic menu page 4 and an external sync signal is input to the GEN LOCK IN connector.

```

+SC PHASE: 000
H PHASE: 135
  
```

Item	Settings
SC PHASE Sub carrier phase adjustment for when the camcorder is genlocked. ^{a)}	000 (normal value) to 999
H PHASE Horizontal phase adjustment for when the camcorder is genlocked. ^{a)}	000 to 135 (normal value) to 199

a) This applies when using an external sync signal to synchronize operation of several camcorders (see page 44).

Viewfinder Basic Menu

Basic menu page 6

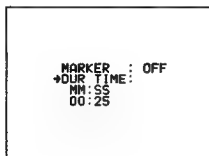


Item	Settings
MARKER Sets marker display ON/OFF.	ON (normal value), OFF Markers are displayed when this setting is ON and is not displayed when it is OFF. When the setting is ON, go to advanced menu page 4 to select the type of marker (see page 89).
DUR TIME Sets the recording time. Setting the recording time before shooting helps you with making scenes of equal duration. When shooting with displaying the recording time of the current cut in the viewfinder (with the REC TIME switch set to DUR), the recording time indication flashes to remind you that the recording time has passed.	00:00 to 59:59 (minute : second) See "Setting the recording time in seconds".

Setting the recording time in seconds

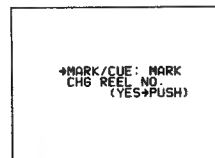
Move the cursor to DUR TIME, then press the MENU dial.

A value of seconds appears.



If you turn the MENU dial when "59" is displayed, the number under "MM" increased by one.

Basic menu page 7

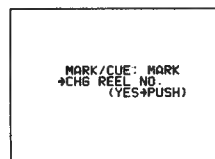


Item	Settings
MARK/CUE Selects Mark mode or Cue mode	MARK (normal value), CUE See "ClipLink Shooting" (page 68).
CHG REEL NO. Sets the cassette name/number	See "To set the cassette name/number" below.

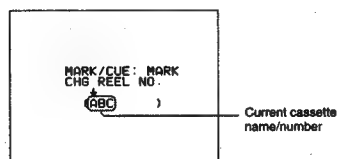
To set the cassette name/number

Note
When using a cassette without cassette memory, you cannot set the cassette name or number.

- 1 Load a cassette.
- 2 Press the MENU switch to move the cursor to CHG REEL NO., then press the MENU dial.



The cursor (→) changes to the text entry arrow (↓) and the current cassette name/number is displayed. ("NO TAPE" is displayed if you neglected to load a cassette.)



- 3 Turn the MENU dial until the desired character appears, and press it.

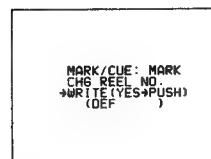
The character cycles through the following sequence.



- 4 Turn the MENU dial to move the text entry arrow.
- 5 Return to step 3 and repeat the text entry procedure.

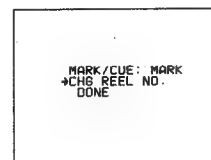
- 6 After completing text entry, move the text entry cursor to the parenthesis position.

The display changes as follows.



- 7 Check your cassette name/number setting, and press the MENU dial if no more changes are required. (To make changes or to abort the procedure for this setting, return to step 2.)

This writes the new cassette name/number to the cassette memory, after which the display changes as follows.



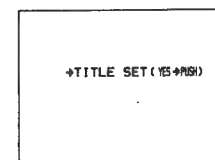
Basic menu pages 8 and 9

You can create a title of up to four lines, each of twelve alphanumeric or punctuation characters, and then save it. It is then possible to record the title over the picture while shooting.

Note
You cannot set the skin detail correction while a title is displayed.

Entering the title (basic menu page 8)

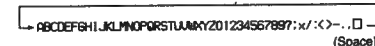
- 1 Press the MENU switch or turn the MENU dial as necessary to display basic menu page 8 (title setting display) in the viewfinder.



If a title is already present, it appears on this screen.

- 2 Press and turn the MENU dial until the desired character appears.

The character cycles through the following sequence.



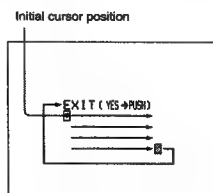
Press the MENU dial when the desired character appears.

(Continued)

Viewfinder Basic Menu

3 Press the MENU dial.

This brings up the cursor on the screen, and switches to cursor transport mode.



4 Turn the MENU dial to move the cursor to the position where you wish to insert a character.

To reverse the direction, turn the dial in the opposite direction.

5 Repeat steps 2 to 4 until the title is complete.

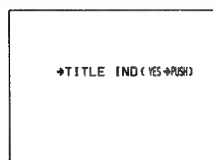


6 Align the cursor to EXIT and press the MENU dial.

This displays basic menu page 8 again. The title created is retained, even when you power the camcorder off.

To record a title (basic menu page 9)

1 Access basic menu page 9 (title display).



2 Press the MENU dial once.

The title is superimposed to the picture displayed on the viewfinder screen.

3 Start shooting.

4 To stop the title recording, press the MENU switch or MENU dial to clear the title display.

When "CHECK DIAG" is displayed

The "CHECK DIAG" indication appears in the status display area whenever the camcorder's automatic self diagnostic function detects an abnormality. Access this page and perform error checking. (This page is displayed as basic menu page 1.)

"CHECK DIAG" will also be displayed if there is a problem on the sync signal input to the GEN LOCK IN connector. Input a proper sync signal and then perform error checking.



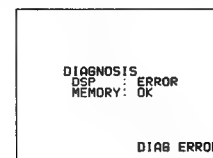
To perform error checking

Press the MENU dial.

The error checking performs on the digital signal processing (DSP) and memory circuits and the results are displayed.

When no error is detected, "OK" appears.

Example: If an abnormality is detected in the DSP circuit.



The error message "DIAG ERROR" appears when the normal indications are displayed. If this message appears, contact your Sony dealer.

Viewfinder Advanced Menu

Advanced Menu Operations

See also the figure on next page.

To display the advanced menu

Move the POWER switch to the ON position while holding down the MENU dial.

To change the page

Align the cursor to the page number and press the MENU dial so that the page number is blinking. Turn the dial until the desired page.

To select items in a page

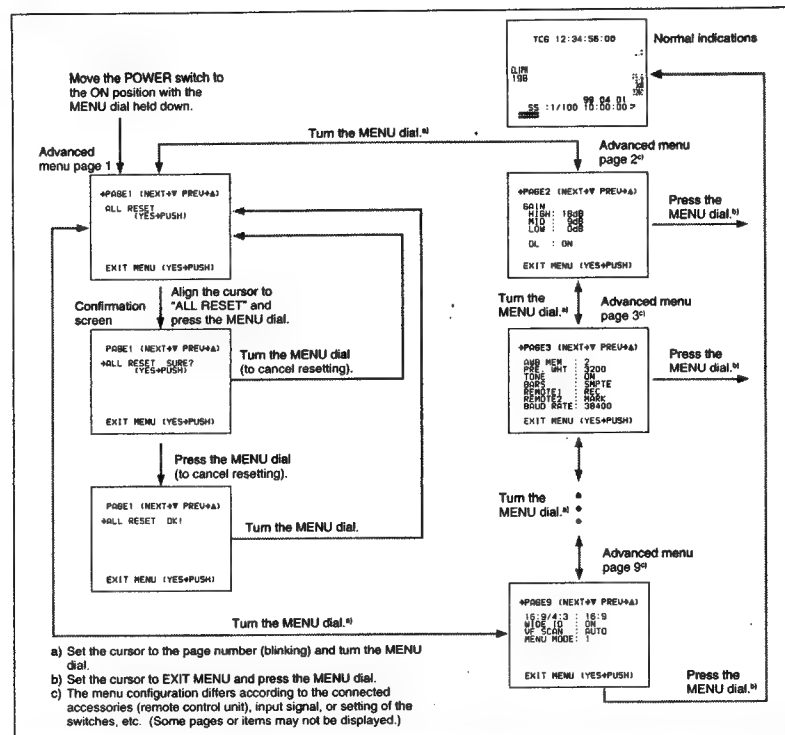
Press the MENU dial to blink the cursor, and press the MENU switch to move the cursor among the menu items. While the cursor is blinking, you can move the cursor by turning the MENU dial.

To change settings

This operation is the same as for the basic menus. For a description of basic menu operations, see page 80.

To reinitialize all settings in the advanced menu to their factory defaults

- 1) Align the cursor to ALL RESET and press the MENU dial. (The indication changes to "ALL RESET SURE?".)
- 2) Press the MENU dial again. (The indication changes to "ALL RESET OK" and reinitialization completes.) To cancel the reinitialization, turn the MENU dial (without pressing).



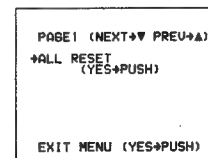
Contents and Settings of Each Menu Page

Each page's contents and settings are described below.

For details of this operation, see "Advanced Menu Operations" (page 86).

Advanced menu page 1

Use this page to return all menu settings to their factory preset values.



Viewfinder Advanced Menu

Advanced menu page 2

```

PAGE2 (NEXT→▼ PREU→▲)
+GAIN : 18dB
  HIGH : 18dB
  MID : 9dB
  LOW : 0dB
  DL : ON
EXIT MENU (YES→PUSH)

```

Item	Settings
GAIN This sets gain values for the positions of the GAIN switch. The HIGH, MID, and LOW values must be set so that LOW < MID < HIGH.	
HIGH Sets the H position.	3 dB, 6 dB, 9 dB, 12 dB, 18 dB (normal value), 18 dB + DPR, 24 dB, 24 dB + DPR, HYPER GAIN
MID Sets the M position.	0 dB, 3 dB, 6 dB, 9 dB (normal value), 12 dB, 18 dB, 18 dB + DPR, 24 dB, 24 dB + DPR
LOW Sets the L position.	-3 dB, 0 dB (normal value), 3 dB, 6 dB, 9 dB, 12 dB, 18 dB, 18 dB + DPR, 24 dB
DL Sets DynaLatitude function ON/OFF. This setting is valid only when the OUTPUT/DL/DCC+ switch has been set to CAM/DL.	ON (normal value), OFF When set to ON, the amount of DynaLatitude effects is set in the basic menu page 2 (see page 81). For details on the DynaLatitude function, see page 50.

Advanced menu page 3

```

PAGE3 (NEXT→▼ PREU→▲)
+AWB MEM : 2
PRE. WHT : 3200
TONE : ON
BARS : SMPTE
REMOTE1 : REC
REMOTE2 : MARK
BAUD RATE : 38400
EXIT MENU (YES→PUSH)

```

a) For DSR-500WSP: EBU75

Item	Settings
AWB MEM Selects whether or not to make the FILTER control settings (1 to 4) correspond to separate white balance adjustment values stored in memory.	2 (normal value): No correspondence with FILTER control settings. Only two adjustment values (A and B) are stored in memory. 2 × 4FL: Correspondence with FILTER control settings. Each of the four control settings can be used to set A and B adjustment values, for a total of eight settings.
PRE. WHT Selects the color temperature preset for the white balance adjustment.	3200 (normal value): 3200 K 3000: 3000 K
TONE Selects whether or not to output a 1-kHz audio signal with the color bars when the OUTPUT/DL/DCC+ has been set to BARS.	ON (normal value): Outputs audio signal. OFF: Does not output audio signal.
BARS Selects normal width or narrower width for color bars.	SMPTE (normal value for DSR-500WS): Normal width EBU75 (normal value for DSR-500WSP): EBU 75% EBU100 (for DSR-500WSP): EBU 100% SPLIT (for DSR-500WSP): Not for normal operation SNG: Narrower than normal (used for satellite communications, etc.)
REMOTE1 Sets a function for switch 1 of the RM-LG1 connected to the REMOTE connector 1.	REC (normal value): Specifies recording start/stop. MARK: Specifies a Mark IN/OUT point. CUE: Specifies a Cue point. NG: Specifies NG/OK.
REMOTE2 Sets a function for switch 2 of the RM-LG1 connected to the REMOTE connector 1.	REC: Specifies recording start/stop. MARK (normal value): Specifies a Mark IN/OUT point. CUE: Specifies a Cue point. NG: Specifies NG/OK.
BAUD RATE Sets a baud rate for a computer connected to the REMOTE connector 2 (to be supported in the future version).	9600, 38400 (normal value)

Advanced menu page 4

```

PAGE4 (NEXT→▼ PREU→▲)
MARKER : CENT/90%
LIMITS : OFF
+ZEBRA : 1
ZEBRA1 : 70IRE
REC TIME : INT
VF TALLY : x2
LENS SEL : 1
EXIT MENU (YES→PUSH)

```

a) For DSR-500WSP: 70%

Item	Settings
MARKER Selects ON/OFF setting for center marker, size setting (percentage of viewfinder screen area), and display ON/OFF setting.	CENT/90% (normal value): Displays center marker and safety zone marker at 90% size. CENT/80%: Displays center marker and safety zone marker at 80% size. 90%: Displays only safety zone marker at 90% size. 80%: Displays only safety zone marker at 80% size. CENT: Displays only center marker.
LIMITS	OFF (normal value): Displays the image inside the safety zone according to the scan size. 4:3: Displays the image inside the 4:3 safety zone during 16:9 scan size. 14:9: Displays the image inside the 14:9 safety zone during 16:9 scan size.
ZEBRA Selects type of zebra pattern display.	1 (normal value): Displays the zebra pattern over parts having a video level between 70 and 90 IRE (or 70 and 90%). Use the next item (ZEBRA1) to select the base level. 2: Displays the zebra pattern over parts having video levels of 100 IRE or above (or 100% or above). 1/2: Dual display (both 1 and 2)
ZEBRA1 Sets base level for zebra pattern 1.	70 IRE (normal value) to 90 IRE or 70% (normal value) to 90%: Can be set for each IRE step or 1% step.
REC TIME Selects whether to show the recording time (TTL) of the internal VCR or of the external VCR.	INT (normal value): Recording time of the internal VCR EXT: Recording time of the external VCR connected to the VTR connector (26-pin).
VF TALLY Selects whether or not to use more than one REC/TALLY indicators in the viewfinder (displayed only when the DXF-701WS/701WSCE viewfinder is attached).	x1: Uses only the upper REC/TALLY indicator. x2 (normal value): Uses two REC/TALLY indicators.

Item	Settings
LENS SEL Select the types of the lens.	1 (normal value), 2,3,4 For details, see "Designating the lens" on page 121.

Advanced menu page 5

```

PAGE5 (NEXT→▼ PREU→▲)
+SS IND : ALWAYS
LL IND : ON
IRIS IND : ON
GAIN IND : ON
FILTER IND : ON
WHITE IND : ON
SKIN IND : ON
EXIT MENU (YES→PUSH)

```

Item	Settings
SS IND Selects the mode for showing the shutter setting when displaying the normal indications.	3SEC: Displays shutter setting for three seconds only when the setting has been changed. ALWAYS (normal value): Displays the shutter setting at all times.
LL IND Selects whether or not to show the LOW LIGHT indication on the normal indications when inadequate lighting is detected.	ON (normal value): Displays. OFF: Not display.
IRIS IND Selects whether or not to show the lens's F-stop value (iris indication) on the normal indications. The F-stop value is always displayed when in EZ mode.	ON (normal value): Displays. OFF: Not display.
GAIN IND Selects whether or not to always show the gain setting indication on the normal indications.	ON (normal value): Always displays. OFF: Displays for two seconds only when the setting has been changed.
FILTER IND Selects whether or not to always show the FILTER control setting indication on the normal indications. The FILTER control setting indication is always displayed when in EZ mode.	ON (normal value): Always displays. OFF: Displays for two seconds only when the setting has been changed.
WHITE IND Selects whether or not to show the setting of the white balance switch.	ON (normal value): Displays. OFF: Not display.
SKIN IND Selects whether or not to show the setting for skin detail correction.	ON (normal value): Displays. OFF: Not display.

Viewfinder Advanced Menu

Advanced menu page 6

```

PAGE6 (NEXT→▼ PREU→▲)
+AUDIO IND: ON
TAPE IND: ON
TC IND: ON
ID IND: OFF
ID SET: (ABC)
EXIT MENU (YES→PUSH)

```

Item	Settings
AUDIO IND Selects whether or not to show the audio level indication on the normal indications.	ON (normal value): Displays. OFF: Not display.
TAPE IND Selects whether or not to show the remaining tape indication on the normal indications.	ON (normal value): Displays. OFF: Not display.
TC IND Selects whether or not to show the time data indication on the normal indications.	ON (normal value): Displays. OFF: Not display.
ID IND Selects whether or not to display the camera ID when displaying color bars.	ON (normal value): Displays. OFF: Not display.
ID SET Sets the camera ID (up to eight characters, including alphanumeric, symbols, and spaces).	See "To set the camera ID" on below.

To set the camera ID

- Press the MENU switch or turn the MENU dial to move the cursor to ID SET.

The cursor (→) changes to the text entry arrow (↓).

```

PAGE6 (NEXT→▼ PREU→▲)
AUDIO IND: ON
TAPE IND: ON
TC IND: ON
ID IND: OFF
ID SET: (ABC)
EXIT MENU (YES→PUSH)

```

Current camera ID

- Press and turn the MENU dial to move the text entry arrow.

Turn the MENU dial downward to move the cursor to the right, or upward to move it to the left.

- Press and turn the MENU dial to enter the desired characters.

The displayed character changes as you turn the dial.

- Return to step 2 and repeat the text entry procedure.

- When you have finished entering the text, press and turn the MENU dial to move the cursor to the parenthesis position.

This clears the displayed menu and returns to the normal indications.

Advanced menu page 7

```

PAGE7 (NEXT→▼ PREU→▲)
+EZ MODE: CUSTOM*
A:IRIS-AGC: F2.8
A:IRIS-AE: F16
AGC LIMIT: 12dB
EXIT MENU (YES→PUSH)

```

a) At shipping, the EZ MODE is set to STD.

Item	Settings
EZ MODE When the EZ MODE button has been set to EZ mode ON, this selects whether or not to change the settings of other switches and menus to the standard settings. (The EZ mode function cannot be used during remote operation.)	STD (normal value): Changes settings to standard settings. CUSTOM: Changes only some settings to standard settings. <i>For details of the settings when STD or CUSTOM is specified, see "EZ mode settings" on next page.</i>
A:IRIS-AGC Selects auto iris adjustment which sets an F-stop value that can be switched to AGC (displayed only when the EZ MODE is set to CUSTOM).	F1.8, F2.8 (normal value), F4, F5.6
A:IRIS-AE Selects auto iris adjustment which sets an F-stop value that can be switched to AE (displayed only when the EZ MODE is set to CUSTOM).	F5.6, F8, F11, F16 (normal value)
AGC LIMIT Sets an upper limit value for AGC adjustment (displayed only when the EZ MODE is set to CUSTOM).	0 dB, 3 dB, 6 dB, 9 dB, 12 dB (normal value)

EZ mode settings

The following settings are set for the camcorder when EZ mode has been selected.

Item	Settings	
	STD	CUSTOM
Setup file	STD	Selectable
Detail level	±0	Selectable
Master black	±0	Selectable
Black stretch	±0	Selectable
Skin detail	OFF	OFF
Shutter	OFF (AE mode)	OFF (AE mode)
Freeze mix	OFF	OFF
Gain	AGC mode	AGC mode
Hyper gain	OFF	OFF
Iris control method	Automatic	Automatic
Auto iris control mode	STD	STD
Iris override	±0	Selectable
Color bar output	Not output	Not output
AGC upper limit	12dB	Selectable
AGC's F-stop value	F2.8	Selectable
AE's F-stop value	F16	Selectable
ATW	ON	ON
DynaLatitude	OFF	OFF
DCC+	ON	ON
F-stop value indication	ON	ON
Filter indication	ON	ON
Clock indication	OFF	OFF

Advanced menu page 8

```

PAGE8 (NEXT→▼ PREU→▲)
(SET CLOCK W/ UTR)
CLOCK IND: OFF
+DATE MODE: YY MM DD
TIME MODE: 12hours
EXIT MENU (YES→PUSH)

```

Item	Settings
CLOCK IND Selects whether or not to display the date/time on the normal indications.	OFF (normal value): Not display. CAM: Displays. BARS: Displays only when color bars are displayed.
DATE MODE Selects the date display format.	YY MM DD (normal value): Year/month/day MM DD YY: Month/day/year DD MM YY: Day/month/year
TIME MODE Selects whether to display a 12-hour clock (showing A.M. and P.M. hours) or a 24-hour clock.	12hours: 12-hour clock 24hours (normal value): 24-hour clock

Note

Use the VCR menu to set the date and time (see page 105).

Viewfinder Advanced Menu

Advanced menu page 9

```

PAGE9 (NEXT→V PREU→Δ)
+16:9/4:3 : 16:9
WIDE ID : ON
VF SCAN : AUTO
MENU MODE: 1

EXIT MENU (YES→PUSH)

```

Item	Settings
16:9/4:3 Selects whether to put the camera in 16:9 mode or 4:3 mode.	16:9 (normal value) 4:3 a)
WIDE ID Selects whether or not to add a wide aspect ID signal to video output signals in 16:9 mode.	ON (normal value): Adds. OFF: Does not add.
VF SCAN Selects 16:9 or 4:3 as the viewfinder scan size when using the supplied DXF-701WS/701WSCE Viewfinder.	AUTO (normal value): Automatically switch to 16:9 size when the camera is in 16:9 mode, and automatically switch to 4:3 size when the camera is in 4:3 mode. ^{a)} FULL: Regardless of camera's mode (16:9 ^{b)} or 4:3), the viewfinder picture completely fills the display area.
MENU MODE Selects whether or not switch the mode (16:9/4:3) on the basic menu.	1 (normal value): Selects the 16:9 or 4:3 mode only with the advanced menu. 2: Selects the 16:9 or 4:3 mode with both the basic and advanced menus.

- a) Compared to 16:9 mode, the 4:3 mode video appears as if a zoom lens has been adjusted slightly toward the telephoto end (see figure on next page).
b) When the camera is in 16:9 mode, the viewfinder picture appears stretched vertically (see figure on next page).

Advanced menu pages 10 to 13

These pages are displayed only when the SETUP switch has been to FILE.

For details of this operation, see "Setup Files" (page 94).

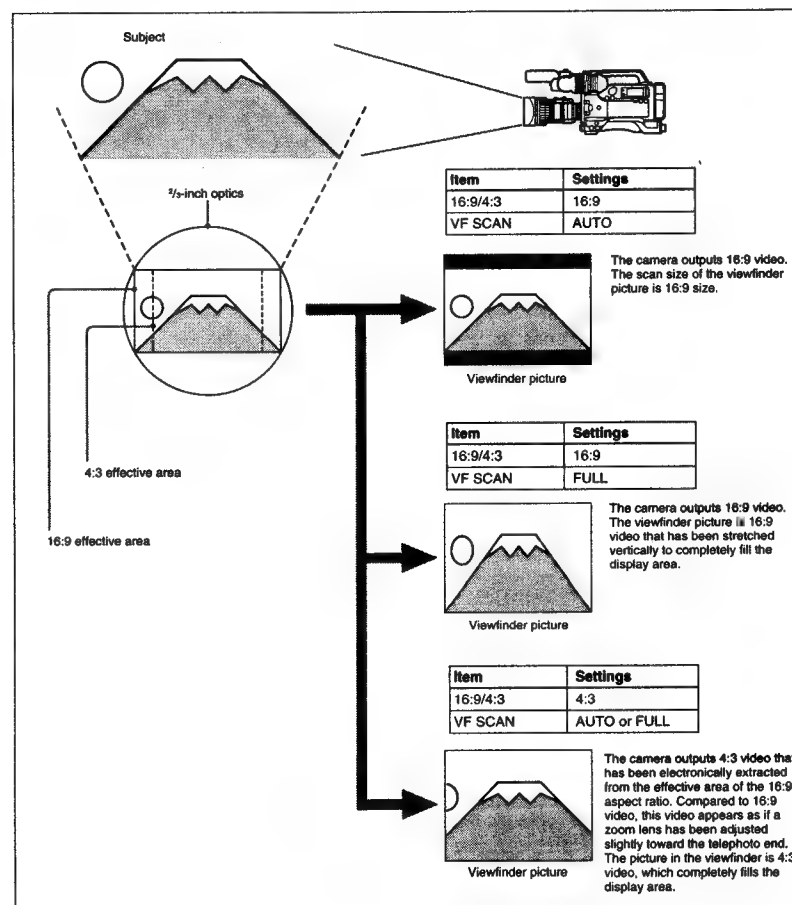
Advanced menu pages 14 and 15

These pages are displayed only when the SETUP switch has been to FILE.

For details of this operation, see "Using SetupNavi and SetupLog" (page 99).

Video Output and Viewfinder Picture

The video output and viewfinder picture of this camera vary as shown below according to the settings of the 16:9/4:3 item and the VF SCAN item of the advanced menu page 9.



Setup Files

You can use setup files to reproduce a particular configuration of settings. You can also revise the contents of setup files.

There are eight types of setup files, of which five are factory preset setup files and the other three are user files.

Note on using an RM-M7G Remote Control Unit

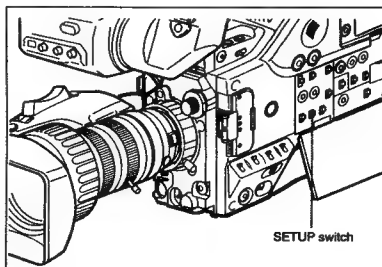
When an RM-M7G is connected to the camcorder, the setup file function cannot be used.

To make it possible to use this function, power OFF the camcorder after disconnecting the RM-M7G, then power ON the camcorder again.

Calling up a Setup File

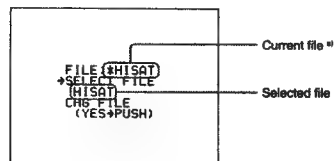
This describes how to call up a setup file and use it to replace the current menu settings.

- 1 Set the SETUP switch to FILE.



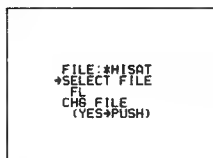
The camcorder is set according to the currently-selected file data.

- 2 Access basic menu page 3.



a) An asterisk (*) appears in front of any factory preset file whose contents have been revised at least once.

- 3 Move the cursor to SELECT FILE with the MENU switch and use the MENU dial to select the desired file.



File	Description
STD	Settings for shooting under standard conditions
HISAT	Settings for making pictures vivid
FL	Settings for shooting under fluorescent lighting
FILMLIKE	Settings for making pictures like ones shot by film camera
SVHS/VHS	Settings to optimize camera image for recording and playback characteristics of S-VHS, VHS, or Hi-8 tape
USER1 to USER3	User setup files (set to STD at shipping)

- 4 Move the cursor to CHG FILE and press the MENU dial.

The display changes as shown below and the selected file is called up.



You can also call up these files via a similar operation in advanced menu page 10. In this page, a file recorded onto a tape can also be called up.

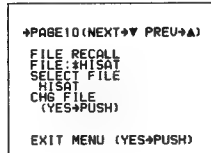
For details, see "To call up files recorded onto a tape" (page 95).

To call up files recorded onto a tape

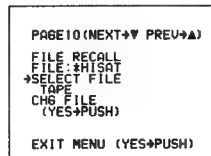
Load the cassette that contains the recorded files.

- 1 Set the SETUP switch to FILE.

- 2 Access advanced menu page 10.

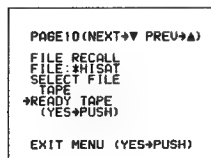


- 3 Move the cursor to SELECT FILE with the MENU switch and move the MENU dial to select TAPE.



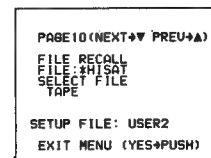
- 4 Move the cursor to CHG FILE and press the MENU dial.

The screen appears as shown below.

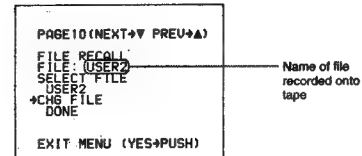


- 5 Press the MENU dial to call up the file. To abort the call up operation, press the MENU switch (the display returns to the one shown in step 3).

During the call up operation, the following display appears.



When the call up operation ends, the display changes as shown below.



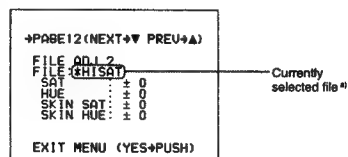
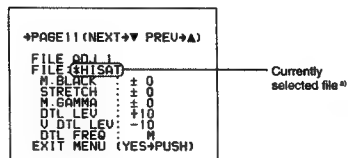
The settings of the camcorder are now replaced by the settings in the called file.

Setup Files

Changing File Settings

When using advanced menu page 11 or 12, you can change the settings about picture quality in setup files. (In basic menu page 1, a part of items are changeable.) The changes are accepted only until another file is called up, after which the original settings are restored. If you save the changes, store the modified file as one of the user files or record it in a cassette. (See the following section "Saving File Settings".)

- 1 Perform the steps described in "To call up files recorded onto a tape" on page 95 to call up the selected file.
- 2 Access advanced menu page 11 or 12.



- An asterisk (*) appears in front of any factory preset file whose contents have been revised at least once.

- 3 Make the desired changes.

Page 11

Item	Settings
M. BLACK, STRETCH and DTL LEV	See "Basic menu page 1" (page 80).
M. GAMMA	-99 to ±0 (normal value) to +99
V DTL LEV	-99 to ±0 (normal value) to +99
DTL FREQ	LL, L, M (normal value), H, HH

Page 12

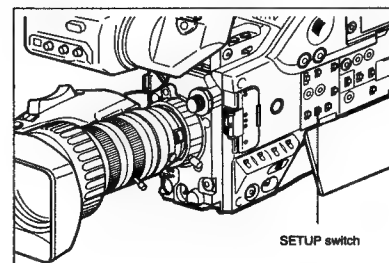
Item	Settings
SAT	-99 to ±0 (normal value) to +99 Adjusts the saturation of the image. Negative adjustment values decrease the saturation and positive adjustment values increase the saturation.
HUE	-99 to ±0 (normal value) to +99 Adjusts the hue of the image.
SKIN SAT	-99 to ±0 (normal value) to +99 Adjusts the saturation in the specified area of the image. Negative adjustment values decrease the saturation and positive adjustment values increase the saturation.
SKIN HUE	-99 to ±0 (normal value) to +99 Adjusts the hue in the specified area of the image.

Saving File Settings

Files whose settings have been changed for certain shooting conditions can be saved as a user file or onto a tape.

For details, see "To save setup files to a tape" (page 97).

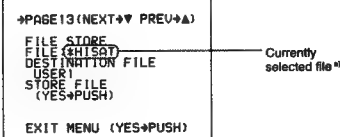
- 1 Set the SETUP switch to FILE.



- 2 Call up a setup file whose settings approximate the desired shooting conditions and then change some of the settings.

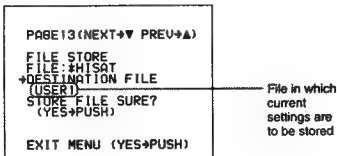
For details of this operation, see "Calling up a Setup File" (page 94), "Changing File Settings" above, "Basic Menu Operations" (pages 80 to 84), and "Advanced Menu Operations" (pages 86 to 92).

- 3 Access advanced menu page 13.



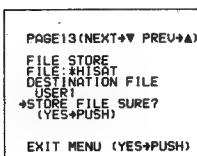
- An asterisk (*) appears in front of any factory preset file whose contents have been revised at least once.

- 4 Move the cursor to DESTINATION FILE with the MENU switch and turn the MENU dial to select USER1, USER2, or USER3.



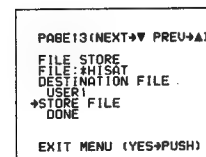
- 5 Move the cursor to STORE FILE? with the MENU switch and press the MENU dial.

The display changes as shown below.



- 6 Press the MENU dial to store the file. To abort the save operation, press the MENU switch (the display returns to the one shown at step 4).

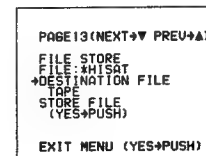
When the save operation is finished, the display changes as shown below.



To save setup files to a tape

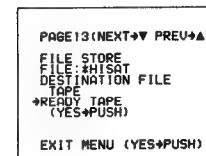
Load the tape onto which the file will be recorded.

- 1 Perform steps 1 to 4 of "Saving File Settings" and select TAPE as the file saving destination.



- 2 Move the cursor to STORE FILE? with the MENU switch and press the MENU dial.

The display changes as shown below.



(Continued)

Setup Files

- 3** Press the MENU dial to store the file. To abort the save operation, press the MENU switch (the screen returns to the screen shown in step 2).

The tape automatically rewinds and recording starts.

The display changes as shown below. ("CAN NOT WRITE" appears on the screen if no tape is loaded or if the loaded tape is write-protected.)

```

PAGE13 (NEXT→▼ PREV→▲)
FILE STORE
FILE: *HISAT
DESTINATION FILE
TAPE

SETUP FILE: *HISAT
EXIT MENU (YES→PUSH)
  
```

After the settings are stored, the following display appears.

```

PAGE13 (NEXT→▼ PREV→▲)
FILE STORE
FILE: *HISAT
DESTINATION FILE
TAPE
→STORE FILE
DONE

EXIT MENU (YES→PUSH)
  
```

Using SetupNavi and SetupLog

The SetupNavi function records a setting of the setup menu and setup files onto a tape, so that the same settings can be called up and used again or copied to another camera.

The SetupLog function records a camera setting every few seconds at shooting and displays the recorded data in the viewfinder during playback.

Note on using an RCP-TX7/RM-M7G Remote Control Unit

When an RCP-TX7/RM-M7G is connected to the camcorder, you can use neither the SetupNavi function nor the SetupLog function.

To make it possible to use these functions, power OFF the camcorder after disconnecting the RCP-TX7/RM-M7G, then power ON the camcorder again.

Setting Up the Camera Using Data Recorded on Tape

The procedure to replace camera's menu settings with settings recorded onto video tape is described here.

- 1** Insert the cassette onto which the data was recorded. Set the SETUP switch to FILE, then set the POWER switch to ON while holding down the MENU dial.

Advanced menu page 1 appears.

```

→PAGE1 (NEXT→▼ PREV→▲)
ALL RESET
(YES→PUSH)

EXIT MENU (YES→PUSH)
  
```

- 2** Turn the MENU dial until advanced menu page 14 appears.

For details of menu operation, see "Advanced Menu Operations" (page 86).

```

→PAGE14 (NEXT→▼ PREV→▲)
SETUP NAVI
TAPE → CAMERA
RECALL DATA
(YES→PUSH)

EXIT MENU (YES→PUSH)
  
```

"NO TAPE" is displayed if you neglected to load a cassette.

- 3** Move the cursor to RECALL DATA with the MENU switch to call up the data recorded on the tape. (Press the MENU switch to cancel.)

The tape is rewound and playback starts. The display changes as follows and the call up operation begins.

```

PLAY
PAGE14 (NEXT→▼ PREV→▲)
SETUP NAVI
TAPE → CAMERA
→CANCEL TO RECALL (YES→PUSH)

SETUP NAVI
(8BCDEF8H1J)
EXIT MENU (YES→PUSH)
  
```

Name of data being called up

To abort the call up operation while in progress Press the MENU dial.

After the data has been read, the following display appears.

```

PAGE14 (NEXT→▼ PREV→▲)
SETUP NAVI
TAPE → CAMERA
→SURE TO RECALL (YES→PUSH)

EXIT MENU (YES→PUSH)
  
```

- 4** Press the MENU dial.

The previous menu settings are overwritten by the data recorded on the tape.

```

PAGE14 (NEXT→▼ PREV→▲)
SETUP NAVI
TAPE → CAMERA
→DONE

EXIT MENU (YES→PUSH)
  
```

- 5** Change the menu settings if necessary.

Using SetupNavi and SetupLog

Recording the Menu Settings Onto a Tape

- 1 Load the tape onto which the settings are to be recorded. Turn the camcorder power on.
- 2 Make your basic menu settings.

For details of this operation, see "Basic Menu Operations" (page 80).

- 3 Again, set the POWER switch to ON while holding down the MENU dial.
- 4 Make your advanced menu settings.

For details of this operation, see "Advanced Menu Operations" (page 86).

- 5 Access advanced menu page 15 and move the cursor to STORE DATA.

```

PAGE15 (NEXT→ PREU→Δ)
SETUP NAVI
CAMERA → TAPE
STORE DATA (YES→PUSH)
EXIT MENU (YES→PUSH)
  
```

"NO TAPE" appears if you neglected to load a cassette.

- 6 Press the MENU dial.

The following display appears.

```

PAGE15 (NEXT→ PREU→Δ)
SETUP NAVI
CAMERA → TAPE
SURE TO STORE (YES→PUSH)
NAME SET (YES→PUSH)
(ABCDEF8H1J)
EXIT MENU (YES→PUSH)
  
```

- 7 Set the cursor to "NAME SET" and press the MENU dial. (Press the MENU switch to cancel.)

The cursor (→) changes to the text entry cursor (↓).

```

PAGE15 (NEXT→ PREU→Δ)
SETUP NAVI
CAMERA → TAPE
SURE TO STORE
NAME SET
(ABCDEF8H1J)
EXIT MENU (YES→PUSH)
  
```

- 8 Enter a name for the data.

Moving the text entry cursor: Press the MENU switch down to move the cursor to the right, and press the MENU switch up to move the cursor to the left.

Selecting the character: Turn the MENU dial until the desired character appears.

- 9 After completing text entry, move the cursor to the parenthesis position.

The display changes as follows.

```

PAGE15 (NEXT→ PREU→Δ)
SETUP NAVI
CAMERA → TAPE
SURE TO STORE
(YES→PUSH)
NAME SET
(ABCDEF8H1J)
EXIT MENU (YES→PUSH)
  
```

- 10 Move the cursor to "SURE TO STORE?" and press the MENU dial (press the MENU switch to cancel).

The tape is rewound and the recording starts. The display changes as follows and the data recording begins.

```

REC PAGE15 (NEXT→ PREU→Δ)
SETUP NAVI
CAMERA → TAPE
CANCEL TO STORE
(YES→PUSH)
SETUP NAVI
(ABCDEF8H1J)
EXIT MENU (YES→PUSH)
  
```

— Name of data being recorded

To abort the data recording while in progress
Press the MENU dial.

After the data has been recorded, the following display appears.

```

PAGE15 (NEXT→ PREU→Δ)
SETUP NAVI
CAMERA → TAPE
→ DONE
EXIT MENU (YES→PUSH)
  
```

Notes

- It takes about three and a half minutes to record the data.
- The former setupnavi data or the recorded contents of the tape are overwritten.

Viewing SetupLog Data

The SetupLog function records camcorder settings every few seconds at shooting and displays the recorded data in the viewfinder during playback.

To view the SetupLog Data, perform the following procedure.

- 1 Turn the power on and load the tape that contains the recording to be viewed.

- 2 Play back the tape.

For details of playback operation, see page 61.

- 3 Press the MENU switch upward (to STATUS position).

The display changes to page 1 of the status display.

```

PLAY TCR 12:34:56:00
SETUP LOG 1/3 1200
WHITE STD 1200
A IRIS STD 1200
FILE STD 1200
DCC ON 1200
SKIN DTL OFF 1200
  
```

— Settings during recording

Each time you press upward the MENU switch, the status display cycles through the status pages and playback display in the order: page 2, page 3, the playback display (containing the current settings), and page 1.

Status display (page 2)

```

PLAY TCR 12:34:56:00
SETUP LOG 2/3 1200
A IRIS STD 1200
DTL LEV STD 1200
M BLACK STD 1200
STRETCH STD 1200
SS 1/100 1200
  
```

Status display (page 3)

```

PLAY TCR 12:34:56:00
SETUP LOG 3/3 1200
M BOMMA STD 1200
U DTL LEV STD 1200
DTL FREQ STD 1200
SKIN SAT STD 1200
SKIN HUE STD 1200
HUE STD 1200
  
```

Notes

- SetupLog data is not recorded while SetupNavi data or a setup file is being recorded onto the portion of a tape. (If you play back that portion of a tape containing SetupNavi data or a setup file, the data displayed in the setup display is not the SetupLog data of the playback picture.)
- In the following cases, changed settings that were not recorded may appear as blank settings.
 - SetupLog data is overwritten at intervals of a few seconds during recording. If the settings are changed frequently for certain items, it may not always be recorded in time.
 - If the recording time is very short, recording may be ended before all of the data has been overwritten.

Setting on the VCR Section — VCR Menu

You can use the VCR menu for settings on the VCR section.

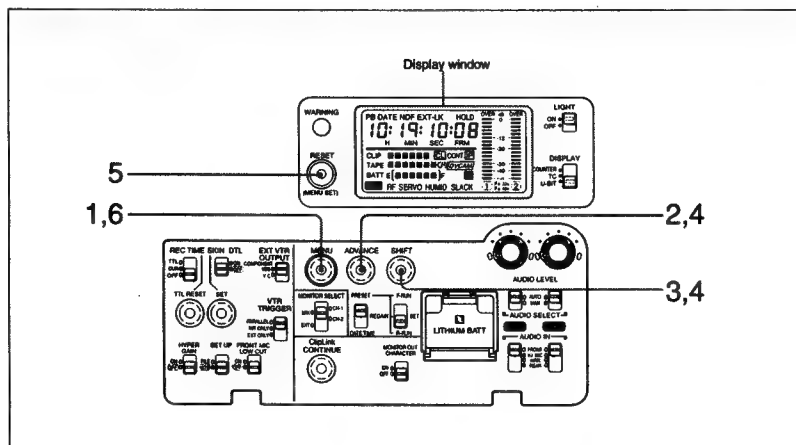
Operation	Menu No.	Reference
Real time clock and calendar settings	101	Page 105
Cumulative hour counts: • Head drum operating hours • Tape transport hours • Operating (power-on) hours	201	Page 105
Frame mode selection for time code (DSR-500WS only)	204	Page 105
Battery capacity indication selection	206	Page 106
Standby-on period setting	207	Page 106
Use auto-check function	210	Page 107
Selection of ClipLink function	211	Page 109
Audio recording mode selection	212	Page 109
Audio reference level selection	213	Page 110
Fade-in/fade-out setting for the audio recording start and stop points	214	Page 110
Use setup add (DSR-500WS only)	220	Page 111
Use setup remove (DSR-500WS only)	221	Page 111

If you want to change the following setting, consult your Sony dealer.

- Outputs the playback time code signals from the TC OUT connector during playback.

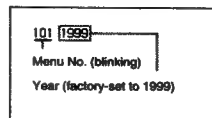
VCR Menu Operation

Basic Operation



1 Press the MENU button.

"DIAG" appears in the display window and the time data display in the display window switches to the menu display.



2 Press the ADVANCE button repeatedly until the desired menu appears.

3 Press the SHIFT button.

This shows the current settings for the menu selected by step 2.
The setting can be changed for the digit that is blinking.

To exit from changing settings

Press the MENU button to close the menu.

4 Change the settings.

Operation	Step
Select digit to be changed	Press the SHIFT button.
Change the value	Press the ADVANCE button.

5 Press the RESET/(MENU SET) button.

This records the new setting and returns to a blinking display of the menu number.

6 Press the MENU button.

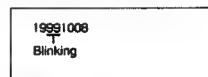
This returns the display window to the display shown before the VCR menu.

Menu 101 Setting the Real Time Clock and Calendar

1 Display menu 101 and press the SHIFT button.

The current calendar setting appears in the setting mode format (yyyymmdd).

Example: October 8, 1999



Note

The first two digits of the year setting cannot be directly changed.

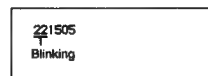
2 Use the SHIFT and ADVANCE buttons in set the desired date.

If there are no more new settings to be made, go directly to step 5.

3 Press the SHIFT button while the date display is blinking (Example: 19991008).

The current time (real time clock) setting is displayed.

Example: 10:15:05 PM



4 Use the SHIFT and ADVANCE buttons to set the current time.

5 Press the RESET/(MENU SET) button.

This starts the clock advance operation.

6 Press the MENU button.

This returns the display window to the display shown before the VCR menu.

The date set can be displayed in the time value indication (see page 62) in the following way.

On the DSR-500WS: Displayed in mmmddyyy format (Example: 10081999)

On the DSR-500WSP: Displayed in dddmmyyy format (Example: 08101999)

Menu 201 Checking the Total Operating (Power-On) Hours

1 Display menu 201 and press the SHIFT button.

Pressing the SHIFT button cycles through the following display items.

Indication	Example
Head drum operating hours	A 0492Hr
Tape transport hours	b 0480Hr
Total operating hours	C 0835Hr
Menu number	201 0492

2 Check the indication, then press the RESET/(MENU SET) button, and then the MENU button.

This returns the display window to the display shown before the VCR menu.

Menu 204 Selecting Frame Mode (DF/NDF) for Time Code (for DSR-500WS Only)

Select frame modes when setting the time code.

Drop-frame mode (factory setting): When adjusting the discrepancy between time code value and real time

Non-drop-frame mode: When you need not adjust the discrepancy between time code value and real time

For details of time code settings, see page 64.

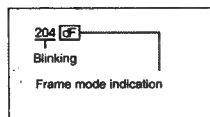
(Continued)

VCR Menu Operation

1 Display menu 204.

The menu number and the current frame mode setting are shown.

Example: dF (drop-frame mode)

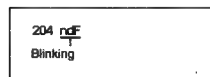


If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button to make the frame mode start blinking, then press the ADVANCE button.

This switches the frame mode display as shown below.

Example: ndF (non-drop-frame mode)



3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and the display window returns to the display shown before the VCR menu.

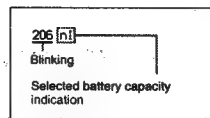
Menu 206 Selecting Battery Capacity Indication

This selects the indication type of battery capacity.

1 Display menu 206.

The selected menu number is displayed, along with the name of the currently selected battery.

Example: nI (Indication for the NP-1B/BP-90A)



If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button until the desired battery name is displayed, then press the ADVANCE button.

Pressing the ADVANCE button cycles through the following indications.

nI → LI → Antn → Auto

Indication	Meaning
Auto (factory setting)	Automatic detection of battery type.
nI	Indication for NP-1B/BP-90A battery is selected.
LI	Indication for BP-L40/L60/L60A/L90/L90A battery is selected.
Antn	Indication for Anton Bauer Magnum battery is selected ^{a)} .

a) To use the Anton Bauer Magnum Battery System, a special battery mount developed by Anton Bauer Corporation is required. For details, contact an Anton Bauer dealer or your Sony dealer.

3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and the display window returns to the display shown before the VCR menu.

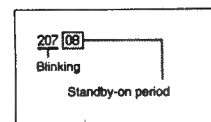
Menu 207 Setting Standby-On Period

At recording pause state or playback pause state, the camcorder waits for a certain standby-on period and then automatically switches to standby-off mode. This standby-on period can be set in advance.

1 Display menu 207.

The selected menu number is displayed, along with the current standby-on period setting (in minutes).

Example: 8 minutes



If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button until the standby-on period starts blinking, then press the ADVANCE button.

Each press of the ADVANCE button changes the setting as follows.

08 (factory setting) → 01 → 03 → 05

3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and the display window returns to the display shown before the VCR menu.

Menu 210 Using Auto-Check Function

On the DSR-500WS/500WSP, the internal check can be automatically performed using the auto-check function. Meanwhile, a test recording and playback are also performed for about one minute.

Before shooting, it is desirable to perform auto-check and make sure for problems in VCR's internal operations through the result of the internal check displayed in the display window and the video and audio recording qualities.

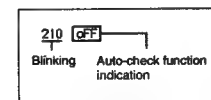
Preparations for testing

Make preparations as shown in the table below.

Preparation	Refer to
Connect a monitor to the MONITOR OUT or S VIDEO OUT connector	Page 25
Connect an earphone or headphones to the EARPHONE connector	Page 15
Prepare a cassette for test recording/playback	Page 53

To perform the auto-check

1 Display menu 210.

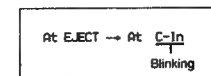


2 Press the SHIFT button to make the auto-check function indication (oFF) start blinking, then press the ADVANCE button to change the indication to "on".

To cancel the auto-check function, press the MENU button to close the menu.

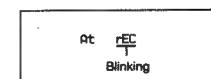
3 Press the RESET/(MENU SET) button.

This changes the display and opens the cassette holder. If there is a cassette in the holder, it is ejected (except during recording).



4 Insert the cassette and close the cassette holder.

The display changes to the following, and the tape is loaded.



5 Use the tape transport buttons to change the tape position for test recording if necessary, or advance to step 6.

(Continued)

VCR Menu Operation

- 6 Press the VTR button on the camcorder or lens.

Test recording starts.

The display changes as shown below during recording. (The hyphen following "At" moves to right.)

At - -> At - ->... -> At -

After about 1 minute, the tape is rewound to the recording start position and playback starts. The following is displayed during playback.

At PLAY

- 7 Check the recording quality of the playback video in the viewfinder or on the monitor screen. Check the recording quality of the playback audio from the speaker, earphone, or headphones.

If the recording quality is poor

There may be some kind of problem whether or not it is detected by the internal check. Refer to the section "Troubleshooting" (page 129) and repeat the test. If the recording quality remains poor, contact your Sony dealer.

When playback ends, the internal check result is displayed and the camcorder enters recording pause mode.

- 8 After confirming the result (see the next section "Confirming the result"), press the MENU button.

The display window returns to the display shown before the VCR menu.

Confirming the result

The result of the internal check is displayed in code as shown in the table below. When a problem is indicated, follow the instructions to check the camcorder and cassette. If no errors can be found, contact your Sony dealer.

Also, be sure to check the quality of the playback video and audio (see step 7).

Display	Diagnostic result
At good	VCR's internal operations are normal. If the video and audio recording qualities are normal, the unit is ready for use.
At ng-01	There may be a problem in the VCR or the cassette. Contact your Sony dealer.
At ng-02	There may be a problem in VCR's internal operations or data loading from the tape. Clean the video heads using the DVM-12CL Cleaning Cassette (see page 126) and repeat the auto-check. If the result is the same, contact your Sony dealer.
At ng-03	There may be a problem in the link between the camera and VCR sections. If not, correct the error and repeat the auto-check. If the result is the same, contact your Sony dealer.
At ng-04	Check whether the REC/SAVE switch is set to SAVE. If so, repeat the auto-check with setting the switch to REC or using another cassette whose REC/SAVE switch is set to REC. If the result is the same, contact your Sony dealer.
At ng-05	Check whether a cassette is inserted. If not, insert a cassette and repeat the auto-check. If the result is the same, contact your Sony dealer.
o-HAUL	If the video and audio recording qualities are normal, the unit is ready for use. However, the unit requires service. It is desirable to consult your Sony dealer.
At Abort	The test recording or playback and internal check have aborted (when a tape transport button was pressed during recording or playback or when the tape ended). To resume the auto-check, press the MENU button to close the menu and perform the procedure described in the previous section "To perform the auto-check".

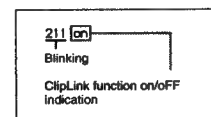
Menu 211 Selecting ClipLink Function

This setting must be made when not using the ClipLink function.

For details of the ClipLink function, see "ClipLink Shooting" (page 68).

- 1 Display menu 211.

The ClipLink function is factory-set to on.



If the setting does not need to be changed, press the MENU button to close the menu.

- 2 Press the SHIFT button to make the ClipLink function on/off indication start blinking. Press the ADVANCE button to change the indication to off.

- 3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and display window returns to the display shown before the VCR menu.

Menu 212 Selecting Audio Recording Mode

The audio recording mode can be set to either of the following modes.

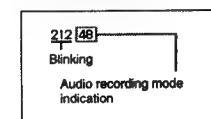
48-kHz mode (factory setting): Enables two-channel recording mode with 48-kHz sampling frequency.

32-kHz mode: Enables four-channel recording mode with 32-kHz sampling frequency (for CH-1 and CH-2).

- 1 Display menu 212.

The menu number and current audio recording mode is displayed.

Example: 48 (2-channel mode with 48-kHz sampling frequency)

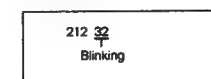


If the setting does not need to be changed, press the MENU button to close the menu.

- 2 Press the SHIFT button to make the audio recording mode indication start blinking, then press the ADVANCE button.

This switches the mode setting to the other audio recording mode.

Example: 32 (4-channel mode with 32-kHz sampling frequency)



- 3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and display window returns to the display shown before the VCR menu.

VCR Menu Operation

Menu 213 Selecting Audio Reference Level

The audio reference level can be set to either of the following.

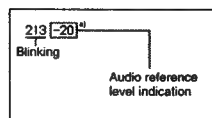
-20 dB (factory setting for DSR-500WS) or -18 dB (factory setting for DSR-500WSP): Audio reference level for professional use

-12 dB: Audio reference level commonly used for consumer DV (The maximum level is 0 dB.)

1 Display menu 213.

The menu number and current audio reference level is displayed.

Example: -20 dB (for DSR-500WS) or -18 dB (for DSR-500WSP)



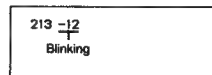
a) For DSR-500WSP: -18

If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button to make the audio reference level display start blinking, then press the ADVANCE button.

This switches the setting to the other audio reference level.

Example: -12 dB



3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and display window returns to the display shown before the VCR menu.

When using the camcorder in a editing system containing both consumer DV and professional equipment, setting the audio reference level to -12 dB is recommended.

Changing the audio reference level setting from -20 dB (or -18 dB) to -12 dB increases the audio recording level by 8 dB (or 6 dB) whether the AUDIO SELECT (CH-1/CH-2) switch is set to AUTO or MANUAL.

Menu 214 Setting Fade-In/Fade-Out for the Audio Recording Start and Stop Points

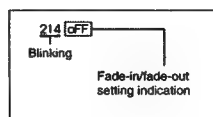
You can reduce noise at back space editing points (if necessary) by setting the fade-in/fade-out to on. The fade-in/fade-out transition time is within one frame ($1/30$ second for DSR-500WS or $1/25$ second for DSR-500WSP).

Note

When an external equipment, such as a VCR, is connected to the DV OUT connector, the fade-in/fade-out function is turned off automatically regardless of the setting on the menu 214.

1 Display Menu 214.

The fade-in/fade-out is factory-set to OFF.



If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button to make the fade-in/fade-out setting indication start blinking, then press the ADVANCE button to change the setting to on.

3 Press the RESET/(MENU SET) button and then the MENU button.

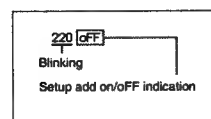
The settings are recorded and the display window returns to the display shown before the VCR menu.

Menu 220 Using Setup Add (for DSR-500WS Only)

Use this menu to add setup to the playback video signals.

1 Display menu 220.

The setup add is factory-set to OFF.



If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button to make the setup add on/off indication start blinking, then press the ADVANCE button to change the setting to on.

3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and display window returns to the display shown before the VCR menu.

Note

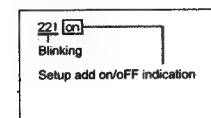
During recording the signal of the image being shot contains setup add, when it is output from the camcorder's S VIDEO OUT and MONITOR OUT connectors. During playback, the setup is removed from the output video signal. To have the setup added during playback, set the setup add to on.

Menu 221 Using Setup Remove (for DSR-500WS Only)

Use this menu to remove setup from the video signal which contains setup (when the DSBK-501/501P is fitted).

1 Display menu 221.

The setup remove is factory-set to on.



If the setting does not need to be changed, press the MENU button to close the menu.

2 Press the SHIFT button to make the setup remove on/off indication start blinking, then press the ADVANCE button to change the setting to on.

3 Press the RESET/(MENU SET) button and then the MENU button.

The settings are recorded and display window returns to the display shown before the VCR menu.

Note

Even if you set setup remove to on, the video signals output from the camcorder's MONITOR OUT connector during recording will contain setup. However, the signals removed setup are recorded onto a tape.

White Balance Adjustment

Adjusting the white balance ensures that as lighting conditions change white objects remain white in the image and tones remain natural.

The color of light emitted varies from one light source to another, and as the lighting changes the apparent color of an illuminated subject changes. It is therefore necessary to adjust the white balance each time the principal lighting source changes.

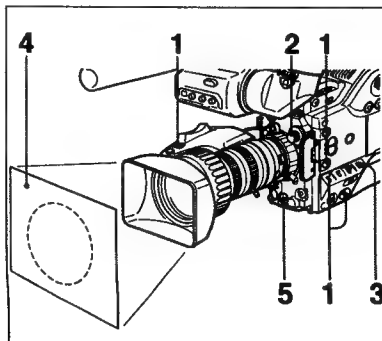
Saving an Appropriate White Balance Value in Memory

You can save two white balance values in separate memories, A and B. Unless changed, the saved values are retained for approximately ten years, even when the camcorder is powered off.

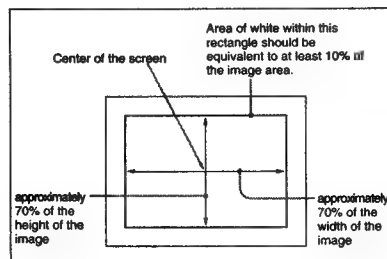
Once a value is saved, you can automatically restore the adjustment by moving the W. BAL switch to the A or B position. This makes shooting under alternating lighting conditions easy.

Separate white balance values for each FILTER control setting

In the default case, as described above, the same two A and B white balance values apply to all settings of the FILTER control. It is possible, however, to change the AWB MEM setting in advanced menu page 3 (see page 88) so that there are eight possibly different values for each of the A and B positions and for the four FILTER control settings.



- Make the following settings.
 - POWER switch: ON
 - OUTPUT/DL/DCC+ switch: one of the CAM positions
 - Lens IRIS selector: A (automatic)
 - ATW button: off
- Set the FILTER control according to the lighting conditions. (See page 49.)
- Set the W. BAL switch to A or B.
- Arrange a white subject (paper, cloth, etc.) under the same lighting conditions as for shooting, and zoom in on it so that as far as possible the whole screen is white.
The minimum white area requirements for the adjustment are shown in the following figure.



- Push the WHT/BLK switch in the WHT direction and release.
The white balance adjustment is carried out. During the adjustment the legend "AUTO WHITE -OP-" appears in the viewfinder. After a few seconds the adjustment is complete, and the legend in the viewfinder changes to "AUTO WHITE -OK-" plus a color temperature, as shown in the following figure.



The adjustment value is automatically saved in memory A or B as selected above.

To save the white balance adjustment for different lighting conditions, repeat steps 2 to 4 on the previous page. You can save two different values for the white balance, in memories A and B.

To recall a white balance value from memory
Before beginning shooting, set the W. BAL switch to the A or B position. This automatically sets the camcorder to the white balance adjustment saved in the corresponding memory.

If white balance adjustment cannot be completed automatically

The warning message "AUTO WHITE -NG-" appears in the viewfinder.

Make the necessary corrections, then carry out the process again.

Warning messages for white balance adjustment

Message	Meaning and corrections to be made
AUTO WHITE -NG- :LOW LIGHT TRY AGAIN	Light level is too low. <ul style="list-style-type: none"> • Increase the illumination level, open the iris, or use the GAIN switch to increase the video signal level. • Check the setting of the FILTER control. • After these checks, retry the adjustment.
AUTO WHITE -NG- : ?? TRY AGAIN	The subject is not white, or the lighting level is too high. <ul style="list-style-type: none"> • Use a white subject. • Lower the illumination level, close the iris, or use the GAIN switch to decrease the video signal level. • Check the setting of the FILTER control. • After these checks, retry the adjustment.
AUTO WHITE -NG- :C.TEMP LOW CHG.FILTER TRY AGAIN	The color temperature is too low. Try the following, in this order of precedence. <ol style="list-style-type: none"> (1) If the FILTER control is in position 2, 3 or 4, change it to position 1, then retry the adjustment. (2) Check that the subject is completely white, then retry the adjustment. (3) The color temperature may be beyond the range of the camcorder. Fit an appropriate color temperature conversion filter, then retry the adjustment.

AUTO WHITE -NG- :C.TEMP.HI CHG.FILTER TRY AGAIN	The color temperature is too high. Try the following, in this order of precedence. <ol style="list-style-type: none"> (1) If the FILTER control is in position 1, change it to position 2, 3 or 4, then retry the adjustment. (2) Check that the subject is completely white, then retry the adjustment. (3) The color temperature may be beyond the range of the camcorder. Fit an appropriate color temperature conversion filter, then retry the adjustment.
WHITE:PRESET	The W. BAL switch is in the PRESET position. Move the W. BAL switch to the A or B position.
BARS	The camcorder is outputting a color bar signal. Move the OUTPUT/DL/DCC+ switch to one of the CAM positions.

Using the Preset White Balance Settings

The camcorder provides two preset white balance settings, for instant shooting with approximately the correct adjustment.

There are also particular shooting conditions under which the preset values may give better results than the human eye adjustment.

- Set the W. BAL switch to PRESET.
- Set the FILTER control.

The white balance is automatically adjusted for 3200 K when the FILTER control is in position 1 and for 5600 K in position 2, 3 or 4.

To switch the 3200 K preset to the 3000 K preset

Change the setting in advanced menu page 3 (see page 88). Depending on shooting conditions, select the better one.

White Balance Adjustment

Light Sources and Color Temperature

Adjustment of the white balance to match the light source is essential to ensure correct color rendering. The color of a light source is indicated as a color temperature in kelvins (K). It is higher for bluish light, and lower for reddish light. When the camcorder is shipped it is adjusted for use with video lights (studio lamps with a color temperature of 3200 K). For use with other light sources, therefore, adjustment is required.

First use the FILTER control to set the approximate color temperature, then carry out white balance adjustment.

The following table shows typical color temperature values for different light sources.

Color temperatures of different light sources			
Light source		Color temperature (K)	
Natural	Artificial		
Clear sky			10,000
Light cloud			8,000
Cloudy or rainy skies		Blue light	7,000
			6,000
	Fluorescent light (daylight white)		5,000
Direct sunlight, noon	Mercury lighting	White light	
	Fluorescent light (white)		
One hour after sunrise or before sunset			4,000
	Fluorescent light (warm white)		3,500
	Studio lighting	Yellow light	3,200
	Halogen lamps and video lights		3,000
Thirty minutes after sunrise or before sunset	Incandescent lighting		2,500
	Sodium street-lighting		
Sunrise or sunset	Candlelight	Red light	2,000

Using the ATW (Auto Tracing White Balance) Function

The ATW function continuously adjusts the white balance automatically to adapt to changes in lighting conditions.

Note

Depending on the shooting conditions, automatic adjustment may not necessarily give optimum results. For the best possible results, use the W. BAL switch.

To use the ATW function

Press the ATW button turning the indicator on.

This activates the ATW function, and the ATW indication appears in the viewfinder.

To disable the ATW function, press the ATW button again, turning the indicator off.

If the ATW function does not operate correctly

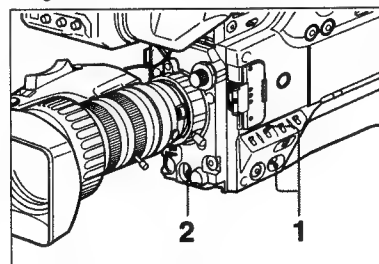
A warning message appears in the viewfinder as shown in the table below.

Message	Meaning and correction to be made
:C.TEMP.LOW	If the FILTER control is in position 2, 3 or 4, change it to position 1, then retry the ATW operation.
:C.TEMP.HIGH	If the FILTER control is in position 1, change it to position 2, 3 or 4, then retry the ATW operation.

Black Balance Adjustment

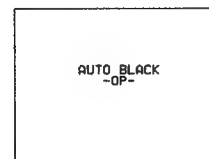
Correct adjustment of the black balance is important for optimum operation of a camcorder. It is necessary when using the camcorder for the first time or after a significant period out of use, and also when there has been a sudden change in temperature.

The adjustment value is saved in memory, and readjustment is not normally necessary after powering the camcorder off or simply when lighting conditions change.



1 Turn on the power and check that the OUTPUT/DL/DCC+ switch is in one of the CAM positions.

2 Push the WHT/BLK switch in the BLK direction and release. The lens iris closes, and black balance adjustment is carried out. During the adjustment the legend "AUTO BLACK -OP-" appears in the viewfinder.



After a few seconds the adjustment is complete, and the legend in the viewfinder changes to "AUTO BLACK -OK-".

If black balance adjustment cannot be completed automatically

The warning message "AUTO BLACK -NG-" appears in the viewfinder.

Make the necessary corrections, then carry out the process again.

Warning messages for black balance adjustment

Message	Meaning and corrections to be made
AUTO BLACK -NG- : IRIS NOT CLOSED TRY AGAIN	The lens iris did not close fully. Check whether the lens cable is connected properly, and whether there is a fault in the lens. If a second attempt to carry out the adjustment fails, consult your Sony dealer.
AUTO BLACK -NG- : ?? TRY AGAIN	The iris opened during adjustment or there is a hardware error. Close the iris and try again. If this fails, consult your Sony dealer.
BARS	The camcorder is outputting a color bar signal. Move the OUTPUT/DL/DCC+ switch to one of the CAM positions.

Shutter Settings

This section covers the settings for electronic shutter speed, CLS (clear scan) and EVS function. The new value for the shutter speed or clear scan frequency and EVS setting remains set until changed, even when the camcorder is powered off.

Shutter speeds

There are five shutter speeds, from $1/100$ s (DSR-500WS) or $1/60$ s (DSR-500WSP) to $1/3000$ s. Increasing the shutter speed reduces blurring when shooting a fast-moving subject. It is also possible to reduce flicker when shooting under fluorescent lighting by changing the shutter speed.

CLS (Clear Scan) function

When shooting a computer screen or projected image, horizontal bands may appear in the camcorder image. This is because the vertical scan frequency of the computer-generated image is different from the vertical scan frequency of the video system. The clear scan function allows you to select a vertical scan frequency to reduce this interference.

EVS (Enhanced Vertical Scan)

This function enhances the vertical scan resolution from 400 to 450 lines (or 450 to 530 lines) to reduce flicker. However, this increases the aliasing.

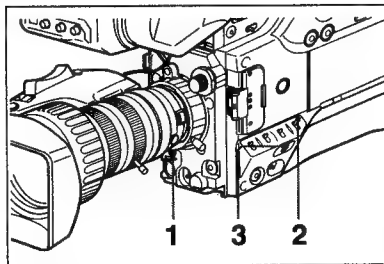
Setting the shutter speed, CLS and EVS function

Notes on setting the shutter speed

- The faster you make the shutter speed, the darker the image becomes. Check the brightness in the viewfinder, and if necessary increase the lighting level or adjust the iris.
- When the shutter speed is very fast, shooting a high intensity subject may cause long vertical tails to appear on the highlights (smear).

Note on setting the CLS function

The vertical scan frequencies of computer screens vary, and it may not be possible to eliminate the interference patterns entirely. Note also that the vertical scan frequency may change depending on the software being run.



- 1 Set the SHUTTER switch to the ON position.

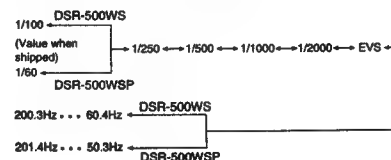
The SHUTTER indicator in the viewfinder comes on, and it is now possible to change the shutter speed or clear scan frequency setting and to set the EVS function. (If the EVS is already selected, the SHUTTER indicator will not light.)

- 2 Operate the MENU switch and MENU dial to align the cursor with the item "SHUTTER" in basic menu page 1, then press the MENU dial.



- 3 Turn the MENU dial to select the required shutter speed, scan frequency or EVS.

The shutter speed or clear scan frequency setting changes in the following order:



When using the clear scan function

Watching the monitor screen, adjust the frequency to give minimum interference.

If there is a black band in the monitor image, reduce the frequency, and if there is a white band, increase the frequency.

To return from the basic menu to the normal indications

Press the MENU switch repeatedly until the normal indications appear. The new setting of the shutter speed, clear scan frequency, or EVS appears in the normal screen display.

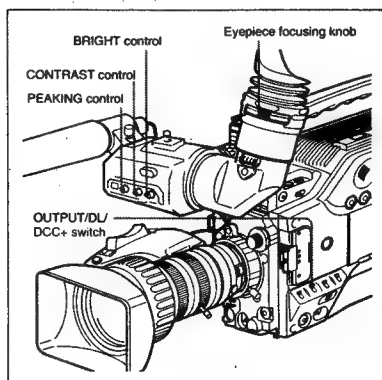
When shooting is finished

Set the SHUTTER switch to the OFF position.

The SHUTTER indicator in the viewfinder goes off.

Viewfinder Screen Adjustments

The following adjustments are provided to improve the visibility of the viewfinder screen. Although these adjustments may make the viewfinder image clearer, they have no effect on the output video signal from the camcorder.



Adjusting the eyepiece focus

Depending on the eyesight of the operator — whether farsighted or nearsighted — the optimal position of the viewfinder image varies. Adjust the eyepiece focus to get the clearest viewfinder image for your eyesight. First focus the image with the lens, then adjust the eyepiece focusing knob. The adjustment range is from -3 to 0 diopters¹⁾ (default when shipped is 0 diopters).

Using an optional part allows you to modify the adjustment range to -2 to +1 diopters or -0.5 to +3 diopters.

For details, consult your Sony dealer.

Contrast and brightness adjustment

Carry out these adjustments with the color bars displayed.

- 1 Set the OUTPUT/DL/DCC+ switch to the BARS position.

The color bars appear in the viewfinder.

- 2 Watching the color bars, turn the CONTRAST and BRIGHT controls to adjust the contrast and brightness.

- 3 Return the OUTPUT/DL/DCC+ switch to its original position.

Outline emphasis adjustment

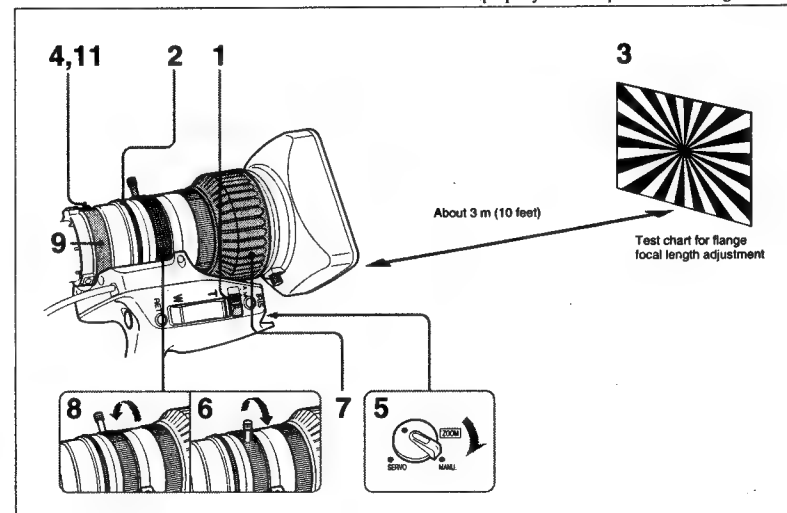
Turning the PEAKING control changes the degree of outline emphasis in the viewfinder image, to make focusing easier.

Adjusting the Lens

Flange Focal Length Adjustment

It is necessary to adjust the flange focal length (the distance from the lens flange to the plane of the image along the optical axis) in the following cases.

- When a lens is fitted for the first time
- After changing lenses
- When during zoom operations the focus does not match properly from telephoto to wide angle

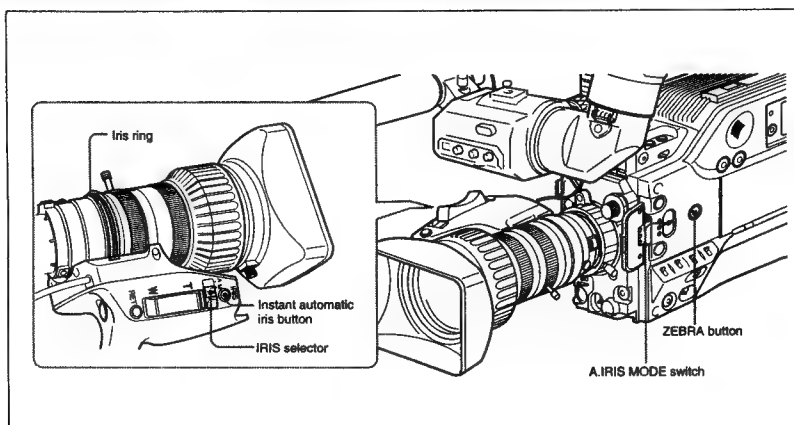


- 1 Set the IRIS selector to the M position.
- 2 Turn the iris ring to F/1.8 (fully open).
- 3 Place the supplied test chart for flange focal length adjustment at a range of about 3 meters (10 feet), and adjust the lighting so that an appropriate video output level is obtained with the iris at F/1.8.
- 4 Loosen the F.B fixing knob.
- 5 Set the ZOOM selector to the MANU. position.
- 6 Turn the zoom ring to the telephoto position.
- 7 Turn the focus ring so that the test chart is in focus.
- 8 Turn the zoom ring to the wide angle position.
- 9 Turn the F.B adjustment ring so that the test chart is in focus. Do not move the focus ring.
- 10 Repeat steps 6 to 9 until the image stays in focus from telephoto to wide angle.
- 11 After adjustment, tighten the screw of the F.B fixing knob.

1) **Diopter:** A unit to indicate the degree of convergence or divergence of a bundle of rays.

Adjusting the Lens

Iris Adjustments



There are three ways of adjusting the iris: automatically, manually, and with the instant automatic iris adjustment function.

Iris adjustment

Adjustment method	Operation
Automatic adjustment mode The iris is adjusted automatically to adapt to changes in the brightness of the subject. This is the mode for normal shooting.	Set the IRIS selector to the A position.
Manual adjustment mode Use this mode in the following cases: • For special effects • When filming a person with a very bright sky background • When shooting a subject with extreme contrast The zebra pattern can be used as a guideline for iris adjustment.	Set the IRIS selector to the M position and turn the iris ring as required.
Instant automatic adjustment function While in manual adjustment mode, this function makes a temporary automatic adjustment.	With the IRIS selector in the M position, hold down the instant automatic iris button for as long as necessary.

To make the image lighter when shooting against the light

In the automatic iris adjustment mode, set the A.IRIS MODE switch to BACK L, turning the indicator on.

To make the image clearer when shooting a subject lit by a spotlight

In the automatic iris adjustment mode, set the A.IRIS MODE switch to SPOT L, turning the indicator on.

Using the zebra pattern in manual adjustment mode

To use the zebra pattern as a guideline for iris adjustment in manual adjustment mode, press the ZEBRA button to set it on. Select the zebra pattern to be displayed in advanced menu page 4 (see page 89).

- **When the subject is a person**
Adjust the iris manually so that the zebra pattern appears on the highlights of the subject's face.
- **For other subjects**
Adjust the iris manually so that the zebra pattern appears on the most important parts of the subject.

Designating the lens

You have to designate the lens number according to the types of your lens. If the number is not designated properly, strange color may appear on the upper and lower of the screen when shooting a white subject.

Set the number in advanced menu page 4 (page 89)

Lens number	Product
1	Fujinon: VCL-916BYA, A16X9 BRM, A12X6.8 BRM Canon: VCL-918BY, YJ18X9B KRS
2	Fujinon: A10X4.8 BEVM/BERD, A15X8 BERM/BERD, A16X9 BERM, A20X8 BEVM/BERD, A19X8.7 BERM, A19X8.7 BRM Canon: J9aX5.2B IRS/IAS, J15aX8B IRS/IAS
3	Canon: J21aX7.8B IRS/IAS, YJ18X9B IRS
4	Set up the data with Sony dealer.

If you use the lens that is not mentioned above, set the lens number as follows:

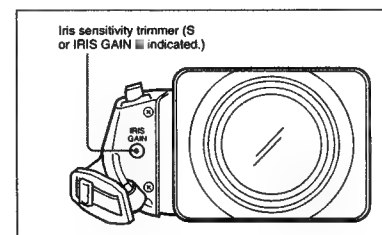
- When using the lens without the extender, set it to 1.
- When using the lens with the extender, set it to 2.
- When using the lens with the ratio converter, set it to 2.

You can also set it more precisely at Sony dealer, according to your lens. In this case, set it to 4.

Adjusting the Iris Sensitivity

You usually need not adjust the iris sensitivity because lenses are equipped with iris sensitivity adjustment function.

In auto iris mode, if hunting or response delay happens, adjust the iris sensitivity using the iris sensitivity trimmer.

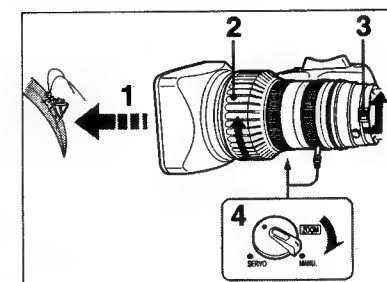


You can see the iris sensitivity trimmer when removing the gum cap on the front of the lens driving unit. Use a mini-screwdriver to turn the trimmer. If you turn it clockwise, the sensitivity increases, and if you turn it counterclockwise, the sensitivity decreases. It is recommended that you confirm the iris sensitivity after replacing the lens.

For more information, refer to the operating instructions for the lens (or consult the lens maker).

Macrophotography

Use the macro function when the subject is short from the front of the lens.



- 1 Bring the lens up to the subject so that the image is the required size.
- 2 Move the focus ring to the closest focus position.
- 3 Press the M button and turn the MACRO ring fully in the direction shown by the arrow.
- 4 Move the ZOOM selector to the MANU. position, and turn the zoom ring to focus the image.

Ending close-up shooting

Return the MACRO ring to its original position (turn fully in the opposite direction to the arrow in the figure).

Reducing the size of the image

After completing steps 1 to 4 above, if you wish to reduce the size of the image, turn the MACRO ring back slightly, then use the zoom ring again to focus the image.

Settings for Special Cases

Settings for special cases

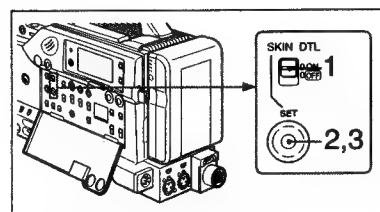
Shooting conditions	Setting	Effect
The background is very bright, and the subject is too dark.	Set the A.IRIS MODE switch to BACK L, turning the indicator on.	This lightens the foreground.
The subject is under a spotlight.	Set the A.IRIS MODE switch to SPOT L, turning the indicator on.	This prevents white burn-out in highlights of faces and clothes.
The subject is completely still (e.g. when shooting documents, drawings, etc.).	Enable the EVS (Enhanced Vertical definition System) function. (See page 116.) Note Enabling the EVS function tends to increase the occurrence of aliasing problems (moiré patterns). Therefore, normally leave the function disabled.	This enhances the vertical resolution.
When you wish to give a lush effect, as when shooting a wedding or similar occasion.	Set the FILE setting to HISAT. (See page 94.)	This increases the saturation of primary colors.
Shooting under fluorescent lighting.	Set the FILE setting to FL. (See page 94.)	This eliminates the blue-green cast, and restores natural hues.
When shooting bright areas mixed with dark areas (Example: A person indoors looking through a window at a bright landscape outdoors).	Set DL to ON in the advanced menu page 2, then set the OUTPUT/DL/DCC+ switch to CAM /DL. (See page 88.)	Prevents white breakup and color faults in bright areas.
When adjusting for skin detail or tone (Example: When shooting to hide skin details).	See "Skin Detail Correction" (page 123) or "Adjusting Color in the Specified Area" (page 123).	Adjusts the skin detail or tone to a designated active area.
To make focusing before shooting easier.	Press the EZ FOCUS button, turning the "easy focus" function on. (See page 13.)	This opens the iris, to make it easier to focus before beginning shooting.
To begin shooting immediately when there is no time to make adjustments.	Press the EZ MODE button, turning the "EZ mode" function on. (See page 14.)	This provides automatic adjustment to a set of standard values, to allow immediate shooting.
The 3200 K preset white balance makes the picture reddish.	Select the 3000 K preset white balance in advanced menu page 3. (See page 88.)	This prevents the picture from reddening.

Skin Detail Correction

The DSR-500WS/500WSP provides an easy push-button function that designates an active skin tone area.

Note

The SKIN DTL SET button is disabled while a title is displayed in basic menu page 8 or color bars are displayed. Before skin detail correction, clear the title or color bars display.



- 1 Set the SKIN DTL switch to ON.

The indication "SKIN AREA: ±0" appears in the viewfinder.

- 2 Press the SKIN DTL SET button.

This causes the area detect cursor to be shown in the viewfinder (for 10 seconds).

- 3 Place the area detect cursor on the target, then press the SKIN DTL SET button.

This designates the correction area, which is indicated by a zebra pattern, and the indication "SKIN AREA: ±0" appears again. If the area detect cursor disappears before designating the area, press the SKIN DTL SET button again to display the cursor. (Returns to step 2.)

- 4 Turn the MENU dial to change the SKIN AREA value (-99 to +99) so that the zebra pattern may be displayed in the target area. Use basic menu page 1 to set the correction level (see page 80).

You can also change color in the designated area (see the following section).

Adjusting Color in the Specified Area

You can adjust the color of the specified area. Perform the same procedure as for the skin detail correction to designate the target area.

- 1 Turn the POWER switch on with holding down the MENU dial so that you can access the advanced menu.

- 2 Display the advanced menu page 12.

```

+PAGE12 (NEXT+V PREU+Δ)
FILE ADJ 2
FILE: HISAT
SAT: ± 0
HUE: ± 0
SKIN SAT: ± 0
SKIN HUE: ± 0
EXIT MENU (YES+PUSH)

```

- 3 Perform the procedure for the skin detail correction to designate the area to which you apply color adjustment.

While this procedure is being performed, the menu is not displayed.

- 4 When advanced menu page 12 appears, change the value of the SKIN SAT and SKIN HUE to adjust color in the area designated in step 3.

Note

Set SKIN DTL to 1.0 in basic menu page 2 if the skin detail correction is unnecessary.

Important Notes on Operation

Fitting the zoom lens

It is important to fit the lens correctly, as otherwise damage may result. Be sure to refer to the section "Fitting the Lens" (See page 32).

Do not cover the unit while operating

Putting a cloth, for example, over the unit can cause excessive internal heat build-up.

Operation and storage

Avoid storing or operating the unit in the following conditions.

- In excessive heat or cold (operating temperature range: 0°C to 40°C (32°F to 104°F))
Remember that in summer in warm climates the temperature inside a car with the windows closed can easily exceed 50°C (122°F).
- In damp or dusty locations
- Locations where the unit may be exposed to rain
- Locations subject to violent vibration
- Do not use the unit close to strong magnetic fields.
- Close to radio or TV transmitters producing strong electromagnetic fields.

Viewfinder

- Do not leave the unit with the eyepiece pointing directly at the sun.
The eyepiece lens can concentrate the sun's rays and melt the interior of the viewfinder.
- Do not use the viewfinder close to strong magnetic fields. This can cause picture distortion.

Avoid violent impacts

Dropping the unit, or otherwise imparting a violent shock to it, is likely to cause it to malfunction.

After use

Set the POWER switch to OFF to turn off the power.

When not use for a period time

Remove the battery pack.

Shipping

- Remove the cassette before transporting the unit.
- If sending the unit by truck, ship, air or other transportation service, pack it in the shipping carton of the unit.

Care of the unit

Remove dust and dirt from the surfaces of the lenses or optical filters using a blower.

If the body of the unit is dirty, clean it with a soft, dry cloth. In extreme cases, use a cloth steeped in a little neutral detergent, then wipe dry. Do not use organic solvents such as alcohol or thinners, as these may cause discoloration or other damage to the finish of the unit.

In the event of operating problems

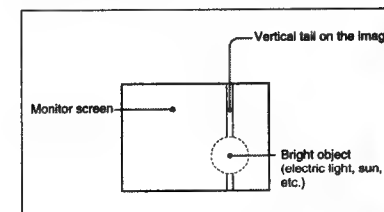
If you should experience problems with the unit, contact your Sony dealer.

Characteristics of CCD Sensors

The following effects may appear in the image. They are characteristic of camcorders using CCDs (charge-coupled devices), and do not indicate a malfunction.

Vertical smear

When shooting a very bright object, such as a light, the highlight tends to produce vertical tails. This effect is much reduced in this camcorder. (Use of the electronic shutter increases this effect.)



White flecks

If the camcorder is operated at a high temperature, white flecks may appear in the image.

Cleaning the Video Heads

Always use the special-purpose Sony PDVM-12CL Cleaning Cassette for cleaning the audio and video heads. Follow the instructions with the cleaning cassette carefully, as inappropriate use of the cleaning cassette can damage the heads.

Note

The PDVM-12CL Cleaning Cassette can be used only once. When the PDVM-12CL is loaded in the camcorder, only STOP, PLAY and EJECT buttons function.

Replacing the video heads

If cleaning the video heads fails to restore picture quality, the heads may be due for replacement. Keep a check of the hours of head drum operation: with normal use, **the heads should need replacing after about 1,500 hours of use.**

When the heads need replacement, contact your Sony dealer.

Check the hours of head drum operation using the VCR menu. For details see "Checking the Total Operating (Power-On) Hours — Menu 201" on page 105.

Replacing other parts

For replacement of all parts other than the video heads, contact your Sony dealer.

Warning System

When the camcorder is powered on, or if a fault occurs during operation, a warning is given in the following ways:

- By warning indications in the display window.
- By means of the WARNING indicator together with a warning tone from the speaker or earphone.

- By the warning indicators in the viewfinder.

You can adjust the volume of the warning tone with the ALARM knob. When this knob is turned to the minimum position, there is no sound output at all.

Operation warnings and action to be taken

Warning indication	Display window	WARNING indication	Warning tones	Viewfinder indicators		Problem	Machine action	What to do
				REC/TALLY	BATT			
	State (blinking/Continuous)	Continuous 1 blink/s 4 blinks/s	Continuous 1 beep/s 4 beeps/s	Continuous 1 blink/s 4 blinks/s				
RF	Continuous ^{a)}					Video head gaps clogged or problem in recording circuit.	After detecting head clogging, recording continues but quality is poor.	Clean the heads. If the problem persists, power off, and consult your Sony dealer.
SERVO	Continuous ^{a)}					Servo lock lost.	Recording continues but quality is poor. This may temporarily blink when the recording starts.	Power off, and consult your Sony dealer.
HUMID	Continuous					Condensation on head drum.	The VCR stops, and all operations are inhibited except eject.	Without powering off, wait until the HUMID indication disappears.
SLACK	Continuous					The tape cannot be wound properly.	Operation stops.	Consult your Sony dealer before doing anything. ^{d)}
TAPE	Blinking ^{a)} (1 blink/s)					Close to the end of tape.	Operation continues.	Replace the cassette as soon as possible.
	Blinking (4 blinks/s)					End of tape.	Operation stops during recording, playback or fast forward.	Replace the cassette or rewind.
BATT	Blinking (1 blink/s)					Battery almost exhausted.	Operation continues.	Replace the battery as soon as possible.
	Blinking (4 blinks/s)					Battery exhausted.	Operation stops.	Replace the battery.

a) During recording or at recording pause.

b) Except during playback, fast forward, rewind, and recording review

c) During recording only

d) Do not operate the camcorder with "SLACK" indication displayed or the tape may be damaged.

For details of warning messages displayed in the viewfinder, see page 77.

Warning System

Condensation

If you move a camcorder suddenly from a very cold place to a warm place, or use it in a very humid location, condensation may form on the head drum. If it is operated in this state, the tape may adhere to the drum, and cause a failure or even permanent damage. Take the following steps to prevent this from happening:

- Remove the cassette before moving the camcorder from a very cold place to a warm place.
- Before inserting a cassette, turn the power on, and check that the HUMID indication is not showing in the display window. If it is showing, wait — do not insert a cassette until the HUMID indication disappears. You can save waiting time if you keep the camcorder powered.

For details of cassette insertion and removal, see the section "Recording on the Internal VCR" on page 52, and for details of the HUMID indication, see the section "Warning System" on page 127.

Troubleshooting

You can use this chart to establish possible causes of an apparent problem; always double-check before sending the unit for repair. If a problem persists, contact your Sony dealer.

Troubleshooting chart

Symptoms	Cause	Remedy
The unit does not power on when you turn the POWER switch on.	There is no battery pack loaded.	Load a battery pack (page 46).
	The battery pack has reached the end of its usable life.	Replace the battery pack with a fully charged one (page 46).
	The AC power adaptor is not connected, or it is not turned on.	Connect the AC power adaptor or turn it on (page 48).
The tape transport does not operate when you press either VTR button.	The POWER switch of the unit is turned off.	Turn the POWER switch on (page 14).
	The unit has reached the end of tape.	Rewind the tape, or load a new cassette (page 53).
	The cassette is set record-inhibited.	Either load a new cassette, or release the record-inhibit (page 51).
	An incorrect type of DVCAM or DV cassette is loaded. (The C// indication blinks.)	Load a correct type of DV or DVCAM cassette (page 51, 53).
The tape transport does not operate when you press any tape transport button.	The unit has reached the end of tape.	Rewind the tape, or load a new cassette (page 53).
	The cassette holder is not solidly closed after the cassette is inserted.	Press on the "PUSH" indication to close the holder solidly (page 53).
The power supply cuts while operating.	The battery pack is exhausted.	Replace the battery pack with a fully charged one (page 46).
The battery goes dead very quickly.	The operating temperature is very low.	Use a BP-L60/L60A or BP-L90/L90A (page 46).
	The battery pack is inadequately charged.	Recharge the battery pack (page 46).
It is not possible to eject the cassette.	The battery pack is exhausted.	Replace the battery pack with a fully charged one (page 46).
	The POWER switch is turned off.	Turn the POWER switch on. (page 14)
	The cassette holder is not solidly closed after the cassette is inserted.	Press on the "PUSH" indication to close the holder solidly and then press the EJECT button (page 53).
The playback picture quality is poor.	The video heads are dirty.	Clean the video heads using a PDVM-12CL Cleaning Cassette (page 126).
The playback picture does not appear.		
The playback sound does not hear.		
All controls except the EJECT button are disabled.	There is condensation on the head drum.	Remove the cassette, power off, and wait until the condensation has evaporated (page 128).
Audio recording is not possible.	The AUDIO LEVEL (CH-1/CH-2) knobs are set to the minimum level.	Adjust the setting of the AUDIO LEVEL (CH-1/CH-2) knobs (page 16).
	The AUDIO LEVEL knob on the front is set to the minimum level.	Adjust the setting of the AUDIO LEVEL knob (page 12).
The recorded sound is distorted.	The audio level is too high.	Adjust the setting of the AUDIO LEVEL (CH-1/CH-2) knobs, and record again (page 16).
The recorded sound has a high noise level.	The audio level is too low.	Adjust the setting of the AUDIO LEVEL (CH-1/CH-2) knobs, and record again (page 16).
The indication "Er91-13F" appears in the display window.	The unit has failed in loading or saving the cassette memory data.	Load a new cassette (page 53).
The cassette is automatically ejected.	An incorrect type of cassette is loaded.	Load a correct type of cassette (page 53).

(Continued)

Appendix 129



Appendix



Appendix

Troubleshooting

Troubleshooting chart (continued)

Symptoms	Cause	Remedy
The time code setting is not possible.	At the recording, the ClipLink function is set to on (meaning ClipLink shooting is allowed) in menu 211. CONT is displayed in the display window and the time code generator is in the REGEN mode.	Only the REGEN mode can be used for ClipLink shooting. If you will not perform ClipLink shooting, set the ClipLink function to OFF (see page 109).
The time code value does not advance though the TC mode switch 1 or 2 is set to the F-RUN or DATE/TIME.		

Specifications

DSR-500WS/500WSP

Imaging element	Three-chip interline transfer CCD
Pixel resolution	980 (horizontal) × 494 (vertical) (DSR-500WS) 980 (horizontal) × 582 (vertical) (DSR-500WSP)
Imaging area	9.6 × 5.4 mm (corresponds to 2/3-inch picture tube)
Built-in filter settings	1: 3200K/3000K 2: 5600K + 1/4ND 3: 5600K 4: 5600K + 1/4ND
Lens mount	Sony 2/3-inch bayonet mount
Signal standards	EIA standard signal (NTSC color system) (DSR-500WS) CCIR standard signal (PAL colour system) (DSR-500WSP)
Scanning system	525 lines, 2:1 interlace (DSR-500WS) 625 lines, 2:1 interlace (DSR-500WSP)
Scanning frequencies	Horizontal: 15.734 kHz (DSR-500WS) 15.625 kHz (DSR-500WSP) Vertical: 59.94 Hz (DSR-500WS) 50.00 Hz (DSR-500WSP)
Synchronization	Internal sync External sync, using signal input (VBS or BS) to the GEN LOCK IN/VIDEO IN connector or input to the VTR connector.
Horizontal resolution ¹⁾	16:9 Mode: 700 TV lines (center) 4:3 Mode: 700 TV lines (center)
Minimum illumination	0.5 lux (at F/1.4, +36 dB) 0.8 lux (at F/1.8, +36 dB)
Sensitivity	2000 lux (F/11.0 standard, 3200 K)
Gain levels	Selectable -3 dB, 0 dB, 3 dB, 6 dB, 9 dB, 12 dB, 18 dB, 18 dB + DPR, 24 dB, 24 dB + DPR, hyper gain (30 dB + DPR)

Video S/N ratio (output from the VIDEO OUT connector)	63 dB (typical) (DSR-500WS) 61 dB (typical) (DSR-500WSP)
Registration	0.05% for all zones, without lens
Input connectors	AUDIO IN CH-1/CH-2: XLR-3 pin × 2, female -60 dBu, 3 kΩ +4 dBu, 10 kΩ (0 dBu = 0.775 Vrms) GEN LOCK IN: BNC 1.0 Vp-p, 75 Ω VIDEO IN: BNC 1.0 Vp-p, 75 Ω (When fitting DSBK-501/501P. The connector shares with GEN LOCK IN) TC IN: BNC 0.5 to 18 Vp-p, 10 kΩ DC IN: XLR-4 pin, male
Output connectors	DV OUT: 6-pin IEEE1394, × 1 AUDIO OUT CH-1/CH-2: phono jack -10 dBu, 47 kΩ (0 dBu = 0.775 Vrms) VIDEO OUT: BNC, 1.0 Vp-p, 75 Ω MONITOR OUT: BNC, 1.0 Vp-p, 75 Ω S VIDEO OUT: DIN 4 pin 1.0 Vp-p, 75 Ω TC OUT: BNC, 1.0 Vp-p, 75 Ω DC OUT: XLR-4 pin, female EARPHONE: mini-jack ∞ to -15.5 dBu variable, 8 Ω
Control connectors	LENS: 12-pin VF: 20-pin REMOTE 1: stereo mini-jack REMOTE 2: 10-pin VTR: 26-pin LIGHT: 2-pin
Power supply	11 to 17 V DC
Power consumption	24 W
Operating temperature	0°C to 40°C (32°F to 104°F)

1) For details on measuring horizontal resolution, see page 134.

Specifications

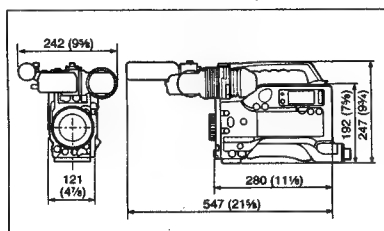
Storage temperature

-20°C to +60°C (-4°F to 140°F)

Mass

3.7 kg approx. (8 lb 3 oz)
(camcorder only)

External dimensions in millimeters (inches)



Tape transport system

Tape speed Approx. 28.2 mm/s

Recording/playback time (using PDV-184ME)

Max. 184 minutes

Fast forward/rewind time (using PDV-184ME)

Max. 12 minutes

Usable cassettes

Model name	Size
PDV-64ME/64MEM/94ME/124ME/ 124MEM/184ME/184MEM	Standard size
PDVM-12ME/22ME/32ME/32MEM/ 40ME/40MEM	Mini size

Video system (at playback with the DSR-85/85P)

Bandwidth	Luminance (Y)	DSR-500WS: 30 Hz to 5.0 MHz ± 1.0 dB DSR-500WSP: 25 Hz to 5.5 MHz $\pm 1.0/-2.0$ dB
	Chrominance (R-Y/B-Y)	DSR-500WS: 30 Hz to 1.5 MHz $\pm 1.0/-5.0$ dB DSR-500WSP: 25 Hz to 2.0 MHz $\pm 1.0/-2.0$ dB
S/N ratio	Luminance	Min. 55 dB
K-factor (K2T, KPB)		Max. 2%
Y/C time delay		Max. 30 nsec.

Audio system (at playback with the DSR-85/85P)

Frequency response	2-channel mode: 20 Hz to 20 kHz $\pm 0.5/-1.0$ dB 4-channel mode: 20 Hz to 14.5 kHz $\pm 0.5/-1.0$ dB
Dynamic range	Min. 80 dB
Distortion (THD) (1 kHz, reference level, 48 kHz)	Max. 0.08%

DXF-701WS/701WSCE Viewfinder

Picture tube	1.5-inch monochrome
Indicators	REC/TALLY ($\times 2$), BATT, TAKE, SHUTTER, GAIN UP
Resolution	600 TV lines
Power supply	12 V DC
Power consumption	2.1 W

Mass 660 g approx. (1 lb 7 oz)

Maximum external dimensions

236 (W) \times 85 (H) \times 219 (D) mm
(9 3/8 \times 3 3/8 \times 8 5/8 inches)

RM-LG1 Remote Control Unit

Dimensions	85 \times 25 \times 12 mm (3 3/8 \times 1 \times 1/2 inches) (excluding projections)
Mass	Approx. 50 g (1 oz) (including cable)
Cable	5 m (16 feet), with mini-plug
Operating temperature range	-10°C to +45°C (14°F to 113°F)
Storable temperature range	-20°C to +60°C (-4°F to 140°F)
Accessories	Stickers (1 set) Panning rod mounting bracket (1)

Supplied accessories

DXF-701WS/701WSCE Viewfinder (1)
Microphone (1)
Wind screen (1)
VCT-U14 Tripod Adaptor (1)
Shoulder strap (1)
RM-LG1 Remote Control Unit (1)
Lens mount cap (1)
Flange focal length adjustment test chart (1)
Binding tie (4)
Operating Instructions (1)

Design and specifications are subject to change without notice.

Related Products

There is a range of Sony products available to meet every conceivable video shooting requirement. For details, consult your Sony sales representative or supplier.

Lenses

VCL-916BYA/918BY Zoom Lens

Remote control unit

RCP-TX7 Remote Control Unit
RM-M7G/LG1/VJ1 Remote Control Unit

VCR products

BVV-5/5P Videocassette Recorder
DNV-5/5P Videocassette Recorder
BVW-50/50P Portable Videocassette Recorder
DSR-20/20P/70/70P Digital Videocassette Recorder
VA-5/5P/90/90P VTR Adaptor

Battery products

BP-L40/L60/L60A/L90/L90A Battery Pack
NP-1B/BP-90A Battery Pack
BC-1WD/1WDCE/410/410CE Battery Charger
BC-LS0/L100/L100CE Battery Charger

AC power supply

CMA-8A/8ACE AC Adaptor
AC-550/550CE/DN1/DN2A AC Adaptor

Synthesized tuner products

CA-WR855 Camera Adaptor
WRR-810A/855A/860A UHF Synthesized Tuner

Microphone products

ECM-670/672 Electret Condenser Microphone
C-74 Condenser Microphone
CAC-12 Microphone Holder
EC-0.5C2/0.3C2 Microphone Cable

Studio equipment

SEG-2550A/2550AP Special Effects Unit
DFS-300/300P/500/500P DME Switcher
DCK-500/500P Chroma Keyer
WEX-2000 Wipe Pattern Extender
DXF-51 5-inch Viewfinder (monochrome)

Cables and miscellaneous

The suffix number on a cable part number indicates the length in meters: e.g. a CCZ-A2 is 2 meters long. (Approximate equivalents in feet: 2 m = 6 ft, 5 m = 16 ft, 10 m = 33 ft, 25 m = 82 ft, 50 m = 164 ft, 100 m = 328 ft)

Camera cables with Z-type 26-pin connectors
CCZ-A2/A5/A10/A25

Camera cables with Q-type 14-pin and Z-type 26-pin connectors

CCZQ-A2/A5/A10/A2AM
LINK cable (DV connecting cable)
CCFD-3L (6-pin \leftrightarrow 4-pin, 3.5 m)

CCF-3L (6-pin \leftrightarrow 6-pin, 3.5 m)

DSBK-301A Index Picture Board

DSBK-501/501P Analog Composite Input Board

LCR-1 Rain Cover

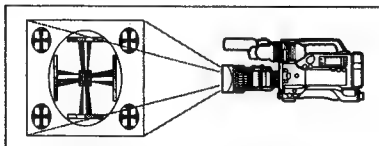
LC-DS500 Carrying Case

LC-DS300SFT Soft Carrying Case

Specifications

Measuring Horizontal Resolution

The number of effective pixels of this camera in horizontal direction is 980. However, when horizontal resolution measurement is executed using a 4:3 resolution chart, the results show a horizontal resolution of approximately 700 TV lines for both 16:9 mode and 4:3 mode as described below.



Horizontal resolution in 16:9 mode

When the horizontal image frame of this camera is aligned with the width of the 4:3 resolution chart, the resolution is about 935 TV lines (see Figure A). However, to measure the resolution of a video camera precisely, the vertical image frame must be aligned with the height of the chart. When this is done, the resolution is approximately 700 (935 × 3/4) TV lines (see Figure B).

Horizontal resolution in 4:3 mode

In 4:3 mode, frame memory is used to extract the 4:3 area from the 16:9 video signals produced by the WS CCD, and the 4:3 signals are electronically enlarged. As a result, the horizontal resolution is approximately 700 TV lines, the same as for 16:9 mode (see Figure C).

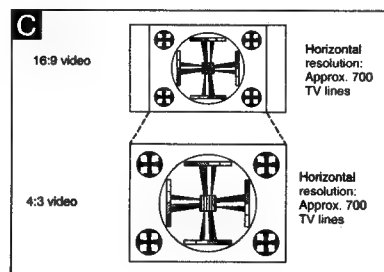
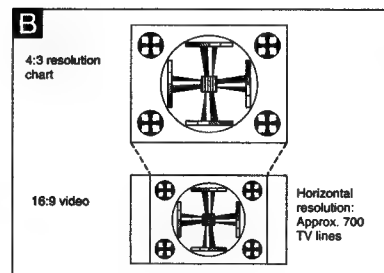
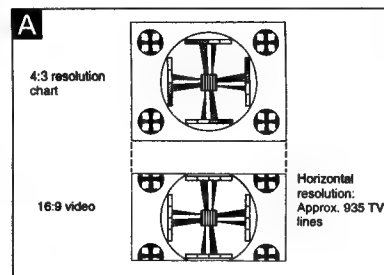
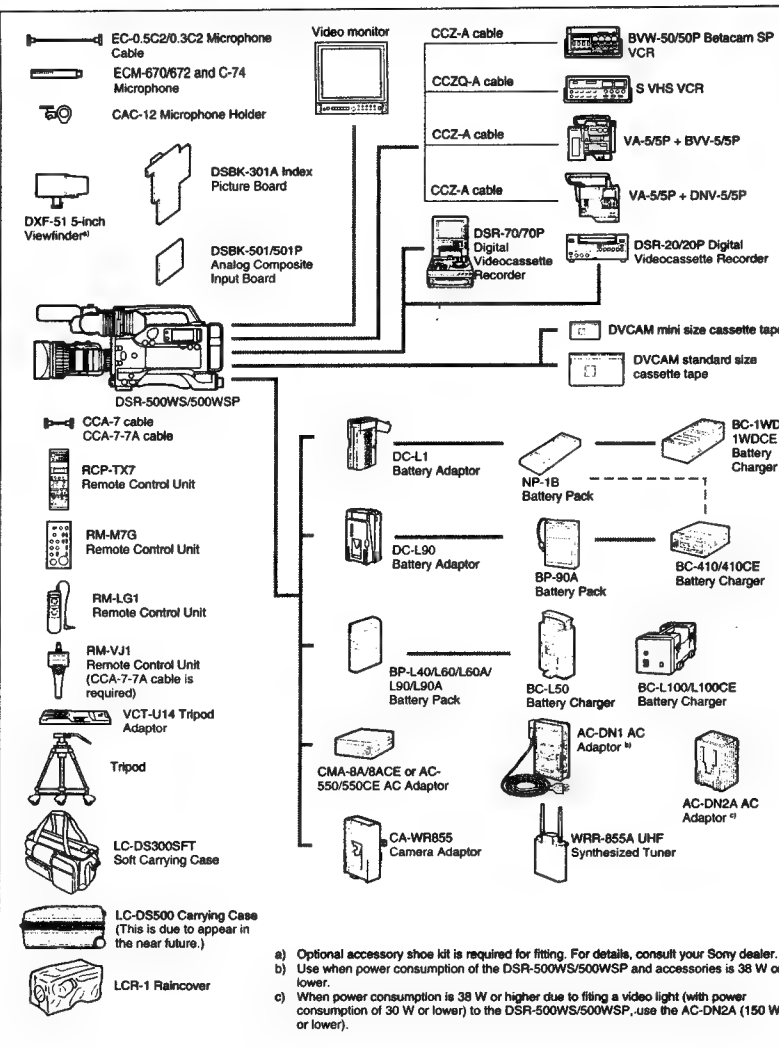


Chart of Optional Components and Accessories



What Is ClipLink?

The ClipLink™ function greatly improves the efficiency of the video production process as a whole by recording various editing-related data on tape when shooting. As such, ClipLink is a revolutionary function that transcends the conventional separation of shooting and editing.

Note

When an external equipment, such as VCR, is connected to the DV OUT connector, the ClipLink function will not work.

How ClipLink Changes Video Production Techniques

The following describes various ways in which ClipLink® video production differs from conventional video production.

Recording of ClipLink log data lightens the shooting workload

When you start shooting a scene, ClipLink log data such as the scene number and time code data are automatically recorded into the cassette memory. This eliminates the need for a conventional "shot list" compiled by someone using a stopwatch, clipboard and pencil. You can also designate unwanted scenes as "NG" (no good) and automatically skip all "NG" scenes when editing.

Recorded Index Pictures drastically cut editing time

The ClipLink function also features Index Pictures a time-saving tool for rough editing. Each Index Picture is a compressed image taken from the start of each scene, which is recorded onto the tape as a still picture. When editing, begin by transferring only the Index Pictures and the ClipLink log data to the EditStation's hard disk. You can also transfer OK scenes only ("NG" scenes are skipped).

Next, begin rough editing by viewing the Index Pictures on the EditStation's GUI display and rearranging them as you wish. This eliminates the difficult work of matching up a handwritten shot list with recorded scenes. After you have completed this rough editing, you can then transfer only the recordings needed for your video program.

High-speed transfer of recordings

It is also possible to transfer the editing material itself between the DSR-85/85P and ES-7 at four times normal speed. In other words, the transfer can be carried out in one fourth of the real time duration. It is of course possible to carry out a transfer at four times normal speed when backing up video and audio data recorded on the disk drive to the DSR-85/85P, or in the opposite direction when loading data backed up on the DSR-85/85P to the disk drive. Thus the time required is much shorter than with conventional equipment (for which, for example, transferring a 40-minute segment of video takes 40 minutes).

Note

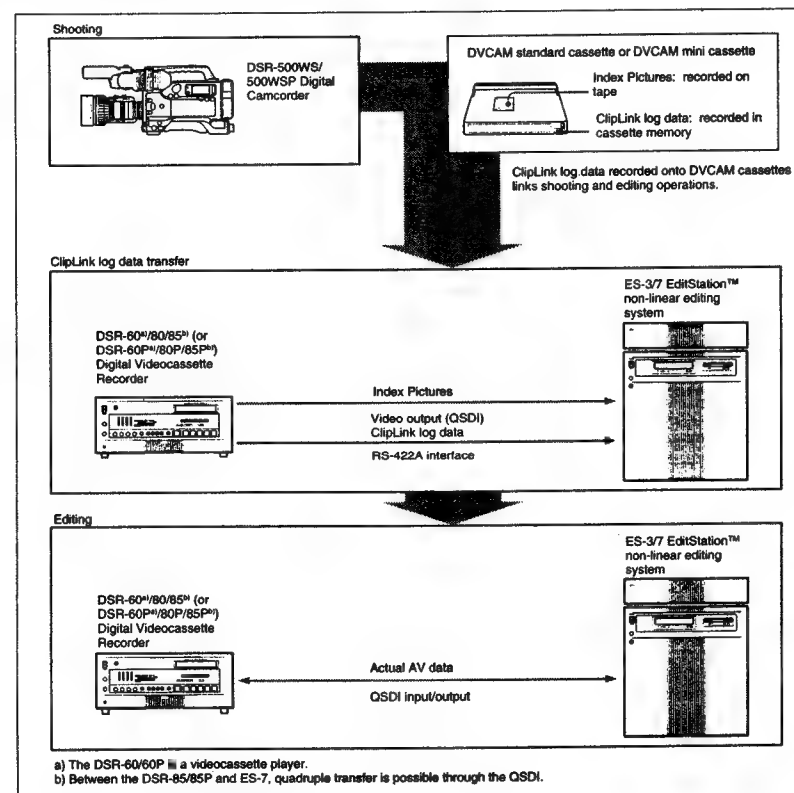
When using a tape recorded by the DSR-500WS/500WSP to transfer digital (video/audio/time code) signals at four times normal speed from the DSR-85/85P Digital Videocassette Recorder to the ES-7 EditStation for editing purposes, there must be about at least 40 seconds of recording on the tape before the IN point. To perform editing without problems, it is recommended that you pre-record at least 40 seconds of color bar signals at the beginning of the tape.

ClipLink Operation Flow

The following is a detailed description of how to use the ClipLink function during the video production process.

Example System Configuration

The following illustration shows the optimum system configuration for using the ClipLink function. ClipLink operation is possible even with a system containing existing analog equipment. However, note that a part of functions are disabled.



1) The ClipLink system is a video production system which uses the cassette memory function.

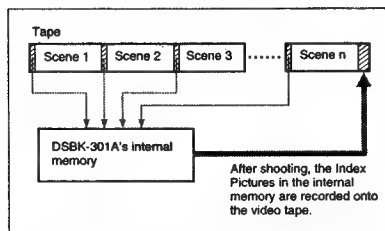
ClipLink Operation Flow

Data Generated When Shooting

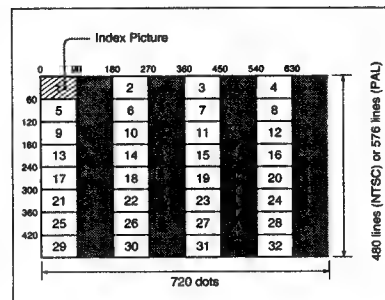
The following describes the kinds of data that is generated when using the ClipLink function.

Index Pictures

When shooting, a single-frame image from the Mark IN point at the start of each scene is recorded as a still picture into the DSBK-301A's internal memory. These images are called "Index Pictures". When you finish shooting, the Index Pictures from all scenes are recorded onto the tape after the last scene.



Up to 32 Index Pictures can be recorded onto the tape space normally occupied by one frame, as shown below.



Seven frame spaces are reserved at the end of the last scene as a recording area for Index Pictures. (A cassette with 16 Kbits of cassette memory can record up to 198 Index Pictures, and a cassette with 4 Kbits of cassette memory can record up to 45 Index Pictures.)

ClipLink log data

ClipLink log data can be recorded automatically or manually into the cassette memory for use as a

convenient alternative to the conventional "shot list". ClipLink log data includes the following items.

ClipLink log data	Description
Reel number (cassette number)	Data (maximum length: 8 digits) consisting of alphanumeric characters and/or symbols (This is left blank at shipping.)
Scene number	A three-digit number from 001 to 198 (starts at 001 and is automatically incremented with each scene).
Take number	This cannot be changed (set to "1" at shipping).
OK/NG	Indicates the OK/NG status of a particular scene. (In the OK case, nothing is recorded.)
Mark IN/OUT point time codes	These are the time codes that indicate the Mark IN and Mark OUT points for each scene (HH:MM:SS). These time codes are recorded when the camcorder has been set to MARK mode. The frame digit is incremented at each Mark IN point and is decremented at each Mark OUT point. (For details, see "Time codes recorded for Mark IN/OUT points" on page 140.)
Cue point time code	This is the time code that indicates the cue points (valid up to the frame digit). This time code is recorded when the camcorder has been set to CUE mode. When in this mode, the time codes at the start and end of a recording (the Rec IN and Rec OUT time codes) are automatically recorded as Mark IN/OUT points.

How to record ClipLink log data

The following describes how to record the various ClipLink log data items.

OK/NG status

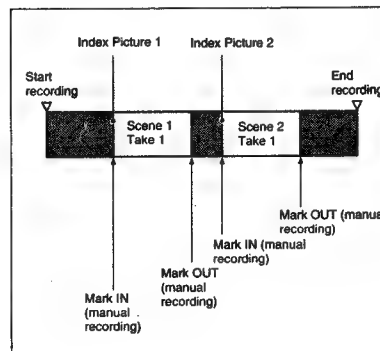
To designate a scene as "NG", press the NG button on the camcorder while shooting the scene or at any time before you begin shooting the next scene.

All scenes that do not receive an "NG" designation are recorded as "OK" scenes.

(When you exit the VCR recording mode, changing the OK/NG status is no longer possible.)

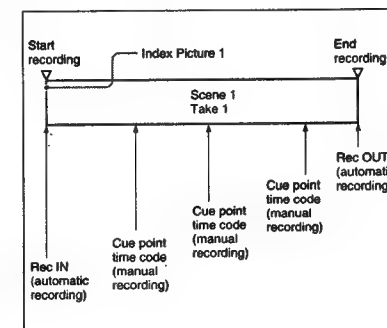
Mark IN/OUT points time codes

This data is especially useful when shooting a video program for which a scenario has been created. Set the camcorder to MARK mode before you start shooting. While shooting, each time you press the camcorder's TAKE button, Mark IN and Mark OUT time codes are recorded alternately.



Cue point time codes

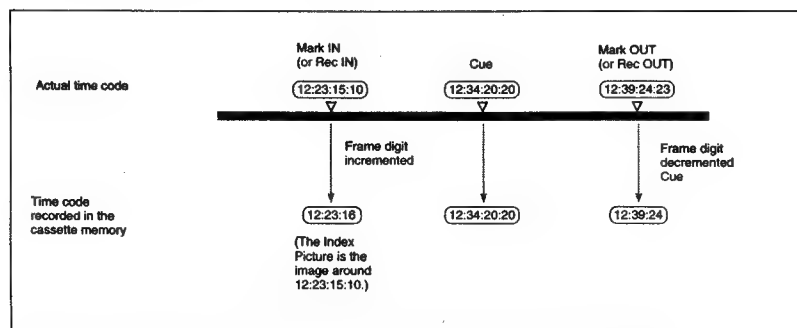
This type of data is especially useful when shooting scenes that may contain unexpected events, such as when shooting for sports coverage or documentaries. Set the camcorder to CUE mode before you start to record. While recording, each time you press the camera's TAKE button, the current time code is recorded as a cue point time code.



ClipLink Operation Flow

Time codes recorded for Mark IN/OUT points

There is a gap between actual time codes and Mark IN/OUT time codes recorded in the cassette memory, as shown in the figure below. The frame digit is incremented at each Mark IN point and is decremented at each Mark OUT point.



Recording capacity for Mark IN/OUT time codes and Cue point time codes

When in MARK mode, up to 198 pairs of Mark IN and Mark OUT points can be recorded (if using a cassette with 16 Kbits of cassette memory).

When in CUE mode, up to 396 time codes points (including all cue point time codes and all Mark (Rec) IN and Mark (Rec) OUT time codes) can be recorded (if using a cassette with 16 Kbits of cassette memory).

Glossary

Aliasing

Distortion of the signal caused by overlap of the baseband signal and lower sideband signal when the signal is demodulated.

Aperture compensation

Electronic compensation for frequency response degradations caused to sampled high-frequency signals by the limited aperture of CCD image sensors.

Black balance adjustment

To balance the black levels of the R, G, and B channels of a video camera so that black has no color.

CCD

Charge-coupled device. A solid state imager used in most recent video cameras in place of a pickup tube. It converts input light levels into electrical charges, which are once stored and then output in the form of voltage variations.

Center marker

A cross that indicates the center of the image on the viewfinder screen.

Color conversion filter

An optical filter used with color video cameras to convert the color temperature of a light source.

Color temperature

The temperature in Kelvins (K) to represent the color of a light source.

Composite video signal

A composite video signal includes a video signal, burst signal, and sync signal.

Condensation

Condensation refers to tiny droplets of water that can appear in a device, such as in the tape transport system. When condensation occurs on a video head drum, the tape may stick to the drum, which can damage not only the tape but also the VCR unit.

DCC

Dynamic Contrast Control. A video camera containing a CCD circuit can handle a wide dynamic range of luminance.

Drum

See "Head drum".

Flare

Dark or colored flashes caused by signal overload through extreme light reflections of polished objects or very bright lights.

Flicker

Repeated change of brightness on the screen, which is caused by frequency difference between the camera's scanning and the variations in the lightning.

Gen-lock

Abbreviation of "generator lock". It refers to the synchronization of a VCR to a reference sync signal.

HAD

Hole-Accumulated Diode. A CCD sensor structure designed to suppress certain types of noise inherent CCDs. See also CCD.

Head drum

A metal cylinder to which a video head is attached. This drum is rotated at high speeds in synchronization with the sync signal during recording and playback.

Horizontal resolution

The capability of a CCD camera to preserve detail in the horizontal resolution.

Usually expressed as the number of vertical lines which can be distinguished in the reproduced image of a test chart.

IRE scale

The scale to determine video signal amplitudes devised by the Institute of Radio Engineers (IRE), an American organization now called the Institute of Electrical and Electronic Engineers (IEEE). The IRE scale includes a total of 140 units, with 100 up and 40 down from zero.

PCM audio

PCM stands for "Pulse Code Modulation." PCM audio means audio signals that have been processed by pulse code modulation. Each analog audio signal is converted into pulses that are generated in rapid succession, and each pulse is recorded as a digital signal having a value of 0 or 1.

Pedestal level

A black level which is the absolute black level of a video signal.

Return video

This refers to a video signal returned from the VCR to the camcorder or from the CCU to one camcorder in a multi-camera system, allowing the camcorder operator to monitor the image output from the camcorder or shot on other camcorders.



Glossary

S/N

Signal-to-Noise ratio. The relation of the strength of the desired signal to the accompanying electronic interference, the noise. If S/N is high, sounds are reproduced with less noise and pictures are reproduced clearly without snow.

Search

The search function enables recorded images or time codes to be viewed while the tape is played back at various forward or reverse speeds, as a means of locating a particular scene in the taped program.

Standby-off mode

One of the stop modes. In this mode, head drum rotation is stopped and the tape tension is slackened. It is not possible to switch instantaneously from this mode to recording or playback mode. This mode is not harmful to the tape or heads.

Standby-on mode

One of the stop modes. In this mode, the head drum continues rotating and the tape remains wound onto the drum. This mode enables instantaneous switching to recording or playback mode. To prevent damage to the tape or heads, the device automatically switches from standby-on mode to standby-off mode after a certain period of time.

S video connectors

Input/output connectors for separate Y (luminance) and C (chroma) signals. This method eliminates interference between Y and C signals that can occur in conventional composite video signals to obtain a higher-resolution picture.

Sync

This refers to the sync (synchronization) signal. The sync signal is used as a reference signal for duplicating the scanning patterns recorded via a camcorder when playing back the recording on a monitor. The sync signal actually includes two signals: a horizontal sync signal and a vertical sync signal.

Time code

The time code is a tape position information signal that includes time and frame data that are recorded onto the tape when shooting so as to facilitate searching of editing points and recorded scenes when viewing or editing.

User bits

These are also referred to as "users' bits". The user bits are a 32-bit segment of the time code recording area. The user can select what to record in this segment and how to use the recorded data. For example, it can be used to record date information in addition to the time code data or ID numbers for tape reels or programs.

Video gain

Amount of amplification for video signals, expressed in decibels (dB).

White balance adjustment

In the light of a particular color temperature, to adjust the white levels of the R, G, and B channels of a color video camera so that any white object shot in that light is reproduced as a truly white image.

Zebra pattern

Striped patterns which appear in the viewfinder to indicate areas of the image where the video level is about 70 IRE (NTSC) or 70% (PAL). The DSR-500WS/500WSP can show areas where the video level is 100 IRE (NTSC) or 100% (PAL).

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Sony Corporation Printed in Japan



SONY

3-866-771-01 (1)

Index Picture Board

Operating Instructions Page 5 **GB****DVCAM**™**DSBK-301A**

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English

PRECAUTION**For the customers in Europe**

This product with the CE marking complies with the EMC Directive (89/336/EEC) issued by the Commission of the European Community.

Compliance with this directive implies conformity to the following European standards:

- EN55103-1: Electromagnetic Interference (Emission)
- EN55103-2: Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following

Electromagnetic Environments(s):
E1(residential), E2(commercial and light industrial), E3(urban outdoors) and E4(controlled EMC environment, ex. TV studio).

1-2. DSBK-301A

English

Overview

The DSBK-301A Index Picture Board is an optional board for the DSR-300/300P/500WS/500WSP DVCAM Camcorder. When fitted in the DSR-300/300P/500WS/500WSP, it allows the recording of index pictures used for scene searching.

For information about how to record index pictures, refer to the Operating Instructions for the DSR-300/300P/500WS/500WSP.

In addition to these Operating Instructions, three fixing screws (PWH 1.4 × 3.5) are also provided with the DSBK-301A.

Caution

If this optional board is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

Fitting Procedure

To fit this board in the DSR-300/300P/500WS/500WSP, use the following procedure.

Note

Before removing and replacing the lithium battery used in the DSR-300/300P/500WS/500WSP, be sure to carefully read the instructions provided with the battery. **Lithium batteries may explode if misused.**

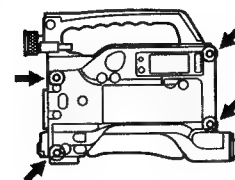
- 1 Set the POWER switch of the DSR-300/300P/500WS/500WSP to ON and take out the lithium battery.

For information about how to take out the lithium battery, refer to the Operating Instructions for the DSR-300/300P/500WS/500WSP.

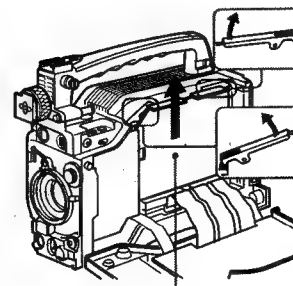
- 2 Set the POWER switch of the DSR-300/300P/500WS/500WSP to OFF and disconnect all power supplies from the DSR-300/300P/500WS/500WSP.
 - If a battery pack is loaded, remove it.
 - If a DC power cord is connected to the DC IN connector, disconnect it.

For information about how to disconnect power supplies from the DSR-300/300P/500WS/500WSP, refer to the Operating Instructions for the DSR-300/300P/500WS/500WSP.

- 3 Loosen the four screws on the right-hand side panel of the DSR-300/300P/500WS/500WSP and remove the panel.



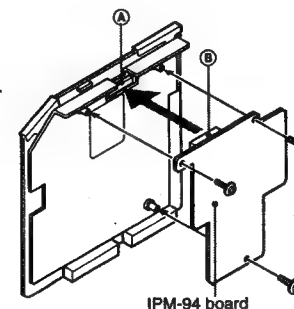
- 4 **DPR-99 board:** Raise the left/right levers on the top and pull out the board.
DPR-141 board: Remove the harness from the DV-21 board. Raise the lever on the left side of the top. Pull out the board.



DPR-99/141 board

- 5 Engage connectors ① and ②, and fix this board (IPM-94) to the DPR-99/141 board using the three supplied screws.

Torque to be applied to the screws
 $0.1 \pm 0.01 \text{ N} \cdot \text{m}$ ($1 \pm 0.1 \text{ kgf} \cdot \text{cm}$)

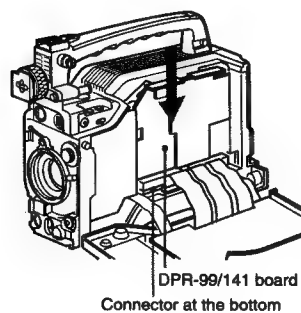


IPM-94 board

Fitting Procedure

- 6 DPR-99 board:** Return the left/right levers on the top to their original positions. Insert the board along the guide into the connector at the bottom.

DPR-141 board: Return the lever on the left of the top to its original position. Insert the board along the guide into the connector at the bottom. Connect the harness (removed in Step 4) to the DV-21 board.



Note

Be careful that the board does not catch the wire or the ribbon cable.

- 7** Replace the right-hand side panel of the DSR-300/300P/500WS/500WSP.

- 8** Set the POWER switch of the DSR-300/300P/500WS/500WSP to ON and replace the lithium battery removed in step 1.

For information about how to replace the lithium battery, refer to the Operating Instructions for the DSR-300/300P/500WS/500WSP.

Note

When the above procedure is performed, the clock and calendar of the DSR-300/300P/500WS/500WSP is reset to the factory-set state. Use VTR menu 101 of the DSR-300/300P/500WS/500WSP to set the clock and calendar again.

For more information about setting the clock and calendar, refer to the Operating Instructions for the DSR-300/300P/500WS/500WSP.

To remove this board from the DSR-300/300P/500WS/500WSP
Follow the fitting procedure in reverse.

SONY

3-866-693-01 (1)

Analog Composite Input Board

Operating Instructions Page 5

GB

DVCAM™**DSBK-501/501P**

1999 by Sony Corporation

English

PRECAUTION**For the customers in Europe
(DSBK-501P only)**

This product with the CE marking
complies with the EMC Directive (89/
336/EEC) issued by the Commission
of the European Community.

Compliance with this directive implies
conformity to the following European
standards:

- EN55103-1: Electromagnetic
Interference (Emission)
- EN55103-2: Electromagnetic
Susceptibility (Immunity)

This product is intended for use in the
following

Electromagnetic Environments(s):
E1(residential), E2(commercial and
light industrial), E3(urban outdoors)
and E4(controlled EMC environment,
ex. TV studio).

1-3. DSBK-501/501P

English

Overview

The DSBK-501/501P Analog Composite Input Board is an optional board for the DSR-500WS/500WSP DVCAM Camcorder. When fitted in the DSR-500WS/500WSP, it allows the recording of the analog composite signal.

For information about how to record the analog composite signal, refer to the Operating Instructions for the DSR-500WS/500WSP.

In addition to these Operation Instructions, two fixing screws (PWH 1.4 x 3.5) and a VIDEO IN label are also provided with the DSBK-501/501P.

Caution

If this optional board is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

Fitting Procedure

To fit this board in the DSR-500WS/500WSP, use the following procedure.

Note

Before removing and replacing the lithium battery used in the DSR-500WS/500WSP, be sure to carefully read the instructions provided with the battery. **Lithium batteries may explode if misused.**

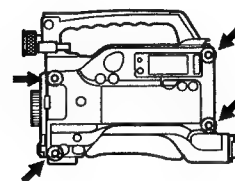
- 1 Set the POWER switch of the DSR-500WS/500WSP to ON and take out the lithium battery.

For information about how to take out the lithium battery, refer to the Operating Instructions for the DSR-500WS/500WSP.

- 2 Set the POWER switch of the DSR-500WS/500WSP to OFF and disconnect all power supplies from the DSR-500WS/500WSP.
 - If a battery pack is loaded, remove it.
 - If a DC power cord is connected to the DC IN connector, disconnect it.

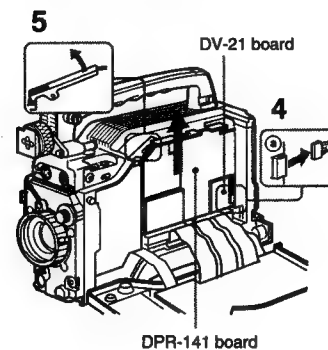
For information about how to disconnect power supplies from the DSR-500WS/500WSP, refer to the Operating Instructions for the DSR-500WS/500WSP.

- 3 Loosen the four screws on the right-hand side panel of the DSR-500WS/500WSP and remove the panel.



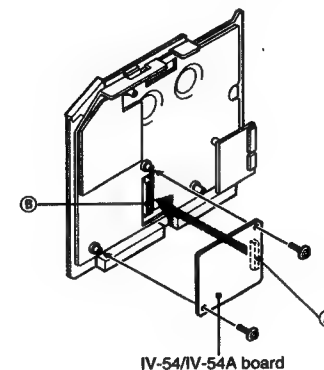
- 4 Remove the harness connected to CN102 (See ④ in the figure below.) on the DV-21 board.

- 5 Raise the lever on left side of the top edge of the DPR-141 board and pull out the board.



- 6 Engage connectors ① and ②, and fix this board (IV-54/IV-54A) to the DPR-141 board using the two supplied screws.

Torque to be applied to the screws
 $0.1 \pm 0.01 \text{ N} \cdot \text{m}$ ($1 \pm 0.1 \text{ kgf} \cdot \text{cm}$)

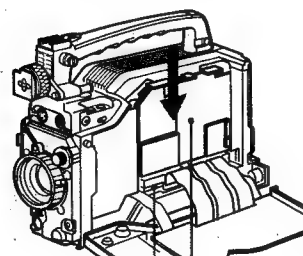


Fitting Procedure

- 7** With the lever on the DPR-141 board returned to their normal positions, insert the DPR-141 board along the board guides until the board is firmly connected to the connector at the bottom.

Note

Be careful that the board does not catch on the harness or the camera ribbon cable when you insert the board.



DPR-141 board
Connector at the bottom

- 8** After inserting the board, connect the harness removed in Step 4 to CN102 on the DV-21 board.
- 9** Replace the right-hand side panel of the DSR-500WS/500WSP. Be careful not to catch on the harness.

- 10** Set the POWER switch of the DSR-500WS/500WSP to ON and replace the lithium battery removed in step 1.

For information about how to replace the lithium battery, refer to the Operating Instructions for the DSR-500WS/500WSP.

Note

When the above procedure is performed, the clock and calendar of the DSR-500WS/500WSP is reset to the factory-set state. Use VTR menu 101 of the DSR-500WS/500WSP to set the clock and calendar again.

For more information about setting the clock and calendar, refer to the Operating Instructions for the DSR-500WS/500WSP.

To remove this board from the DSR-500WS/500WSP

Follow the fitting procedure in reverse.

Affixing the VIDEO IN label

After installing the board, affix the supplied VIDEO IN label to the Camcorder as follows:

Peel off the back of the label and affix it to the recessed area above the Camcorder's GENLOCK IN connector.

SECTION 2

OPTIONAL ACCESSORIES INSTALLATION

2-1. ATTACHING THE 4" OR 5" VIEWFINDER

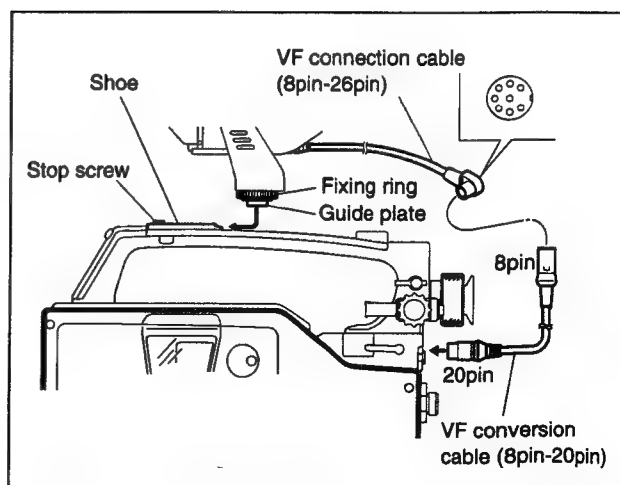
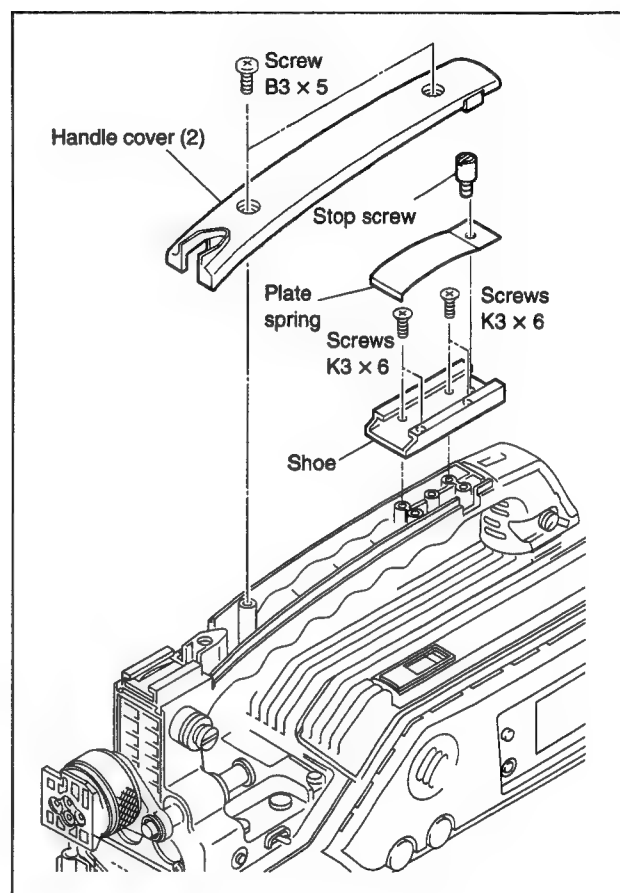
An optional 4-inch viewfinder (DXF-40 series) or 5-inch viewfinder (DXF-50 series) can be attached in accordance with the following procedures:

Parts Required (sold separately)

Name	Sony Part No.
• Accessory shoe kit	A-8274-968-A
Shoe	3-664-218-00
Plate spring	3-664-228-00
Stop screw	3-664-213-00
Screw K3 × 6 (4 pcs)	7-682-247-04
• Conversion cable (8pin-20pin)	1-783-665-11
* No conversion cable is required for DXF-51.	

Attaching Procedure

1. Remove the two screws (B3 × 5) and remove the handle cover (2).
2. Tighten the shoe with four screws (K3 × 6).
3. Fix the plate spring with stop screw.
4. Fit the guide plate in the shoe and tighten the fixing ring.
5. Connect the conversion cable.



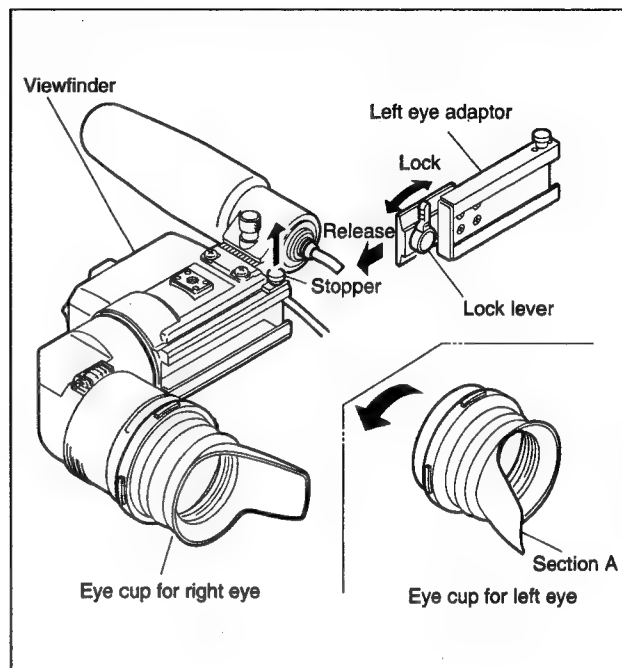
2-2. CHANGING THE VIEWFINDER CORRESPOND TO LEFT EYE

Part Required (sold separately)

Left eye adaptor (Sony Part No.: A-8267-181-A)

Attaching Procedures

1. Remove the viewfinder from the unit.
(Refer to Section 1-1. Digital Camcorder.)
2. Remove the eye cup, and put the eye cup (for left eye) facing the Section A outside.
3. While pushing up the stopper of the viewfinder, attach the left eye adaptor. At this time, pull the lock lever to release locking.
4. Fix the left eye adaptor by pushing the lock lever vertically direction.
5. Attach the viewfinder to the unit.
(Refer to Section 1-1. Digital Camcorder.)

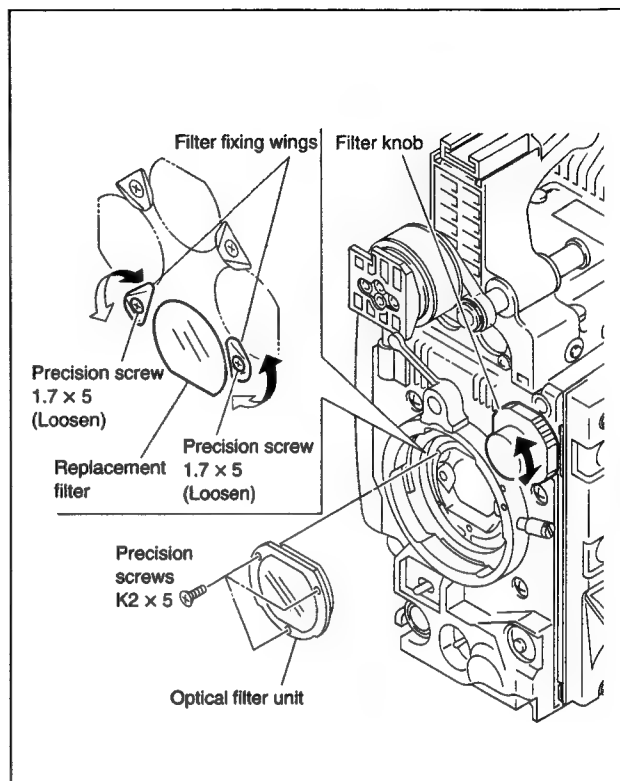


2-3. REPLACING THE FILTER

Type of filter	Sony Part No.
No.1 3200 K	3-708-637-01
No.2 5600 K + 1 / 8ND	3-174-685-01
No.3 5600 K	3-708-637-21
No.4 5600 K + 1 / 64ND	3-174-684-01
5600 K + 1 / 4ND (Sold separately)	3-708-637-11
5600 K + 1 / 16ND (Sold separately)	3-708-637-31
5600 K + 1 / 32ND (Sold separately)	3-174-683-01
CROSS* (sold separately)	3-174-682-01

*When attaching the cross filter, put the crosshatching side outside.

1. Remove the three precision screws ($K2 \times 5$) and remove the optical filter unit.
2. Turn the filter knob to meet the filter to be replaced.
3. Loosen the two precision screws ($K1.7 \times 5$) which are fixing both sides of the filter to move the filter fixing wings as shown in Fig.



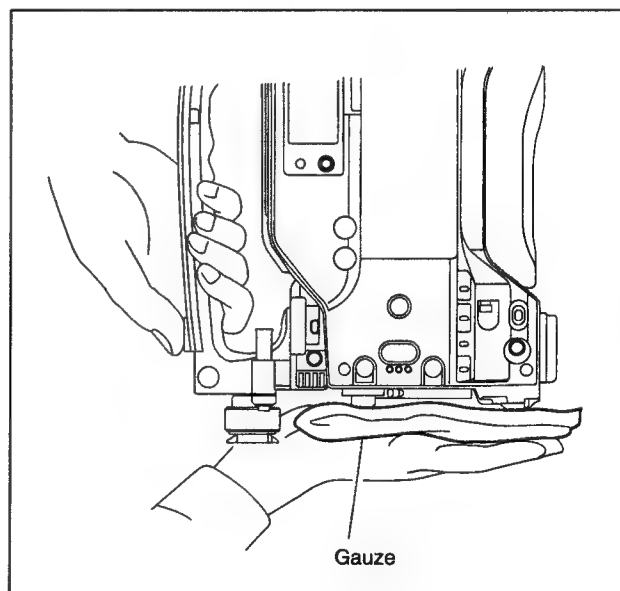
4. Take a grip on the handle, pan the camera downward, and take a filter by the other hand. Be sure to cover the hand with clean cloth, such as a gauze, when picking up the filter in order to keep the surface of filter cleanly.
5. Attach the replacement filter in the reverse order of above.

Point to notice when attaching the filter:

1. Place the filter on the filter disc by holding the circumference of the filter.
2. Fine adjust the position of filter with tweezers.

Note:

After the filter replacement, perform the filter indication setting Page 20 of menu. (Refer to Section 5-2-3.)

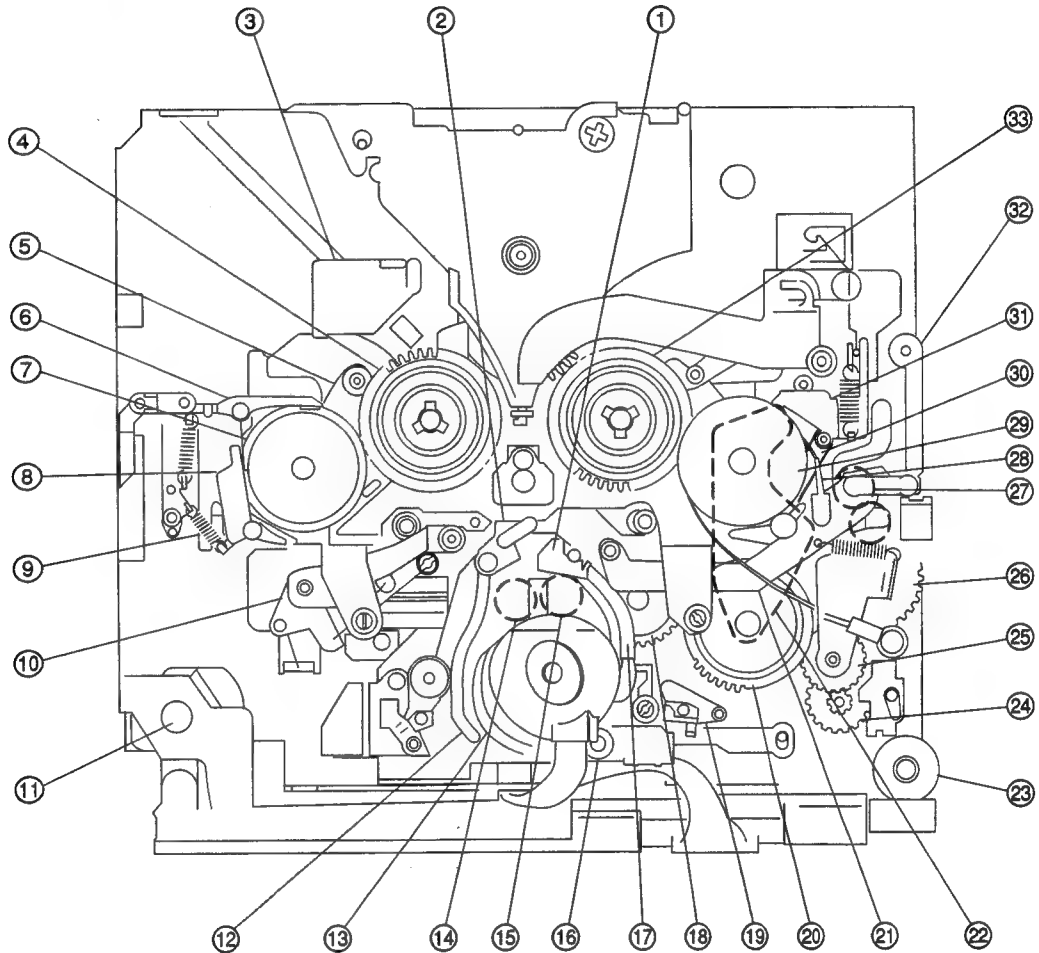


SECTION 3

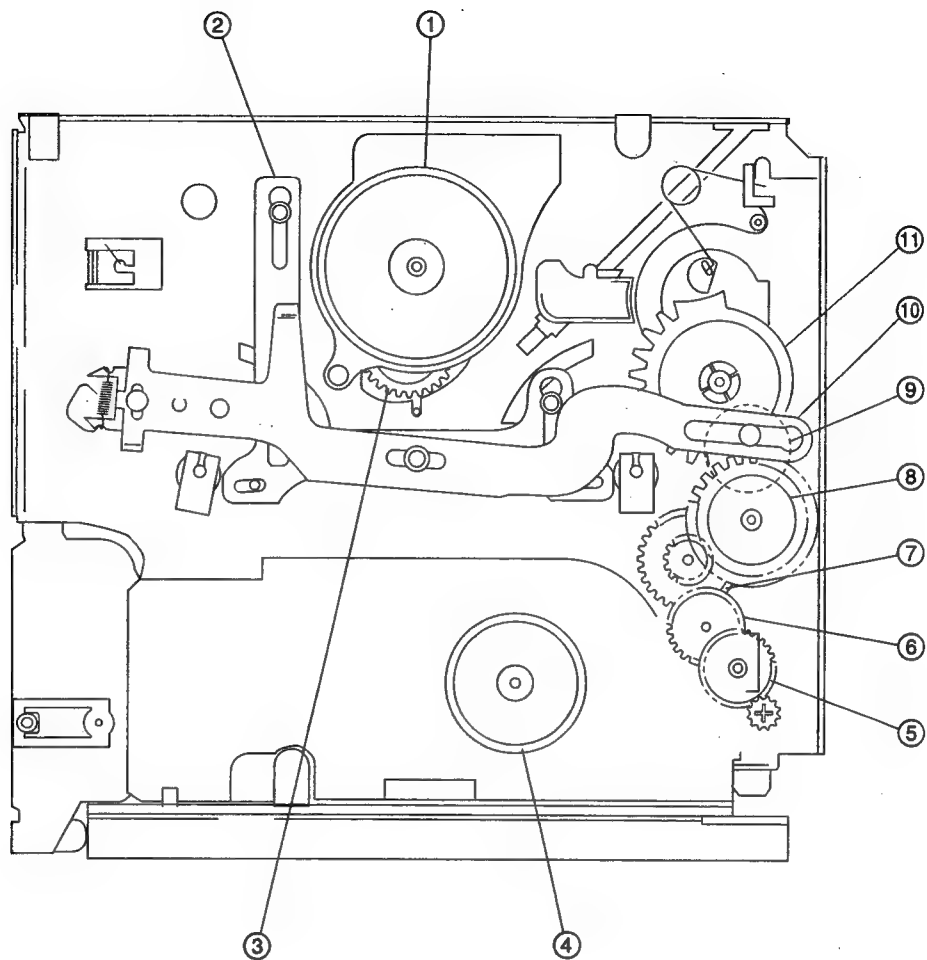
SERVICE INFORMATION

3-1. LOCATION OF MAJOR PARTS

3-1-1. Location of Major Mechanical Parts



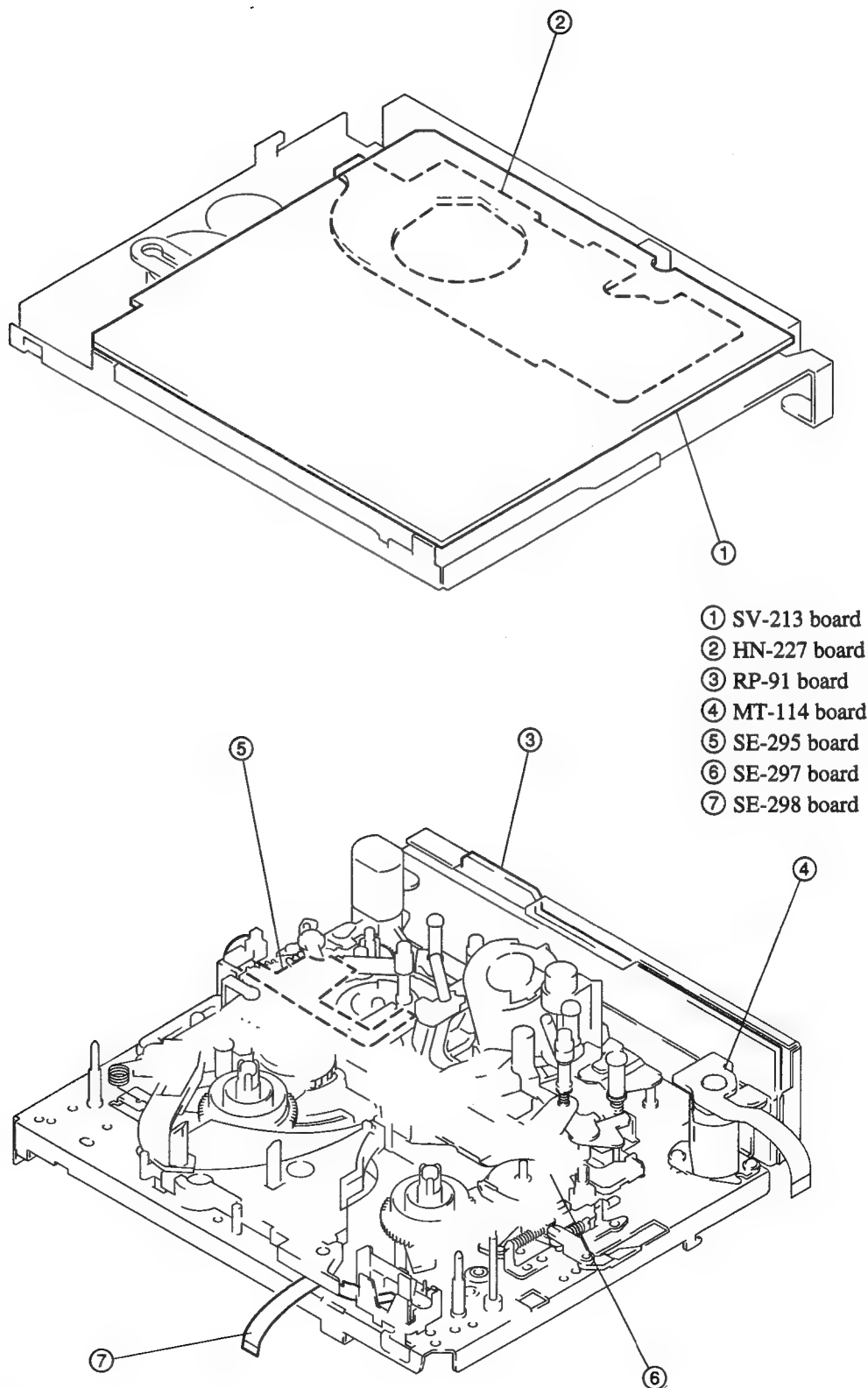
- | | | | |
|----------------------|------------------|----------------------|----------------------|
| ① Coaster (S) | ⑪ Shift motor | ⑳ TR arm | ㉑ Soft brake arm (S) |
| ② Coaster (T) | ⑫ Rail (T) | ㉒ Reel plate (S) | ㉒ Sensor bracket |
| ③ MIC | ⑬ Drum | ㉓ LD motor | ㉓ Reel table (S) |
| ④ Reel table (T) | ⑭ GL (T) | ㉔ No. 1 gear | |
| ⑤ Reel plate (T) | ⑮ GL (S) | ㉕ HC gear | |
| ⑥ TL soft brake | ⑯ C roller | ㉖ Mode gear | |
| ⑦ Sub reel gear (T) | ⑰ Rail (S) | ㉗ Release cam gear | |
| ⑧ Soft brake arm (T) | ⑱ Threading gear | ㉘ TR band | |
| ⑨ Hard brake arm (T) | ㉑ TC assembly | ㉙ Sub reel gear (S) | |
| ⑩ Pinch arm | ㉒ Cam gear | ㉚ Hard brake arm (S) | |



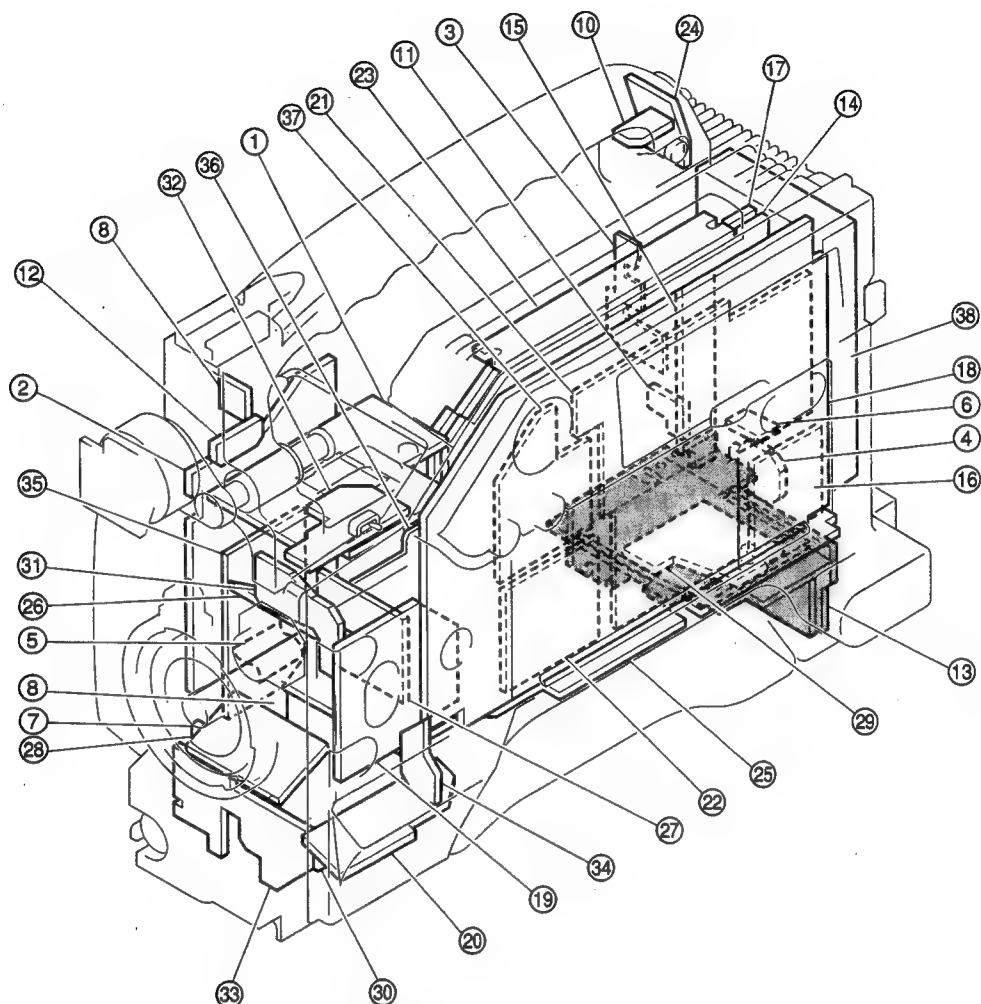
- | | |
|-------------------------------|---------------------|
| ① Reel motor | ⑦ Gear C |
| ② Reel plate compression link | ⑧ Reel drive gear A |
| ③ Idler gear | ⑨ Gear E |
| ④ Capstan motor | ⑩ Reel drive arm |
| ⑤ Gear A | ⑪ Reel drive gear B |
| ⑥ Gear B | |

3-1-2. Location of the Boards

• Mechanical Deck

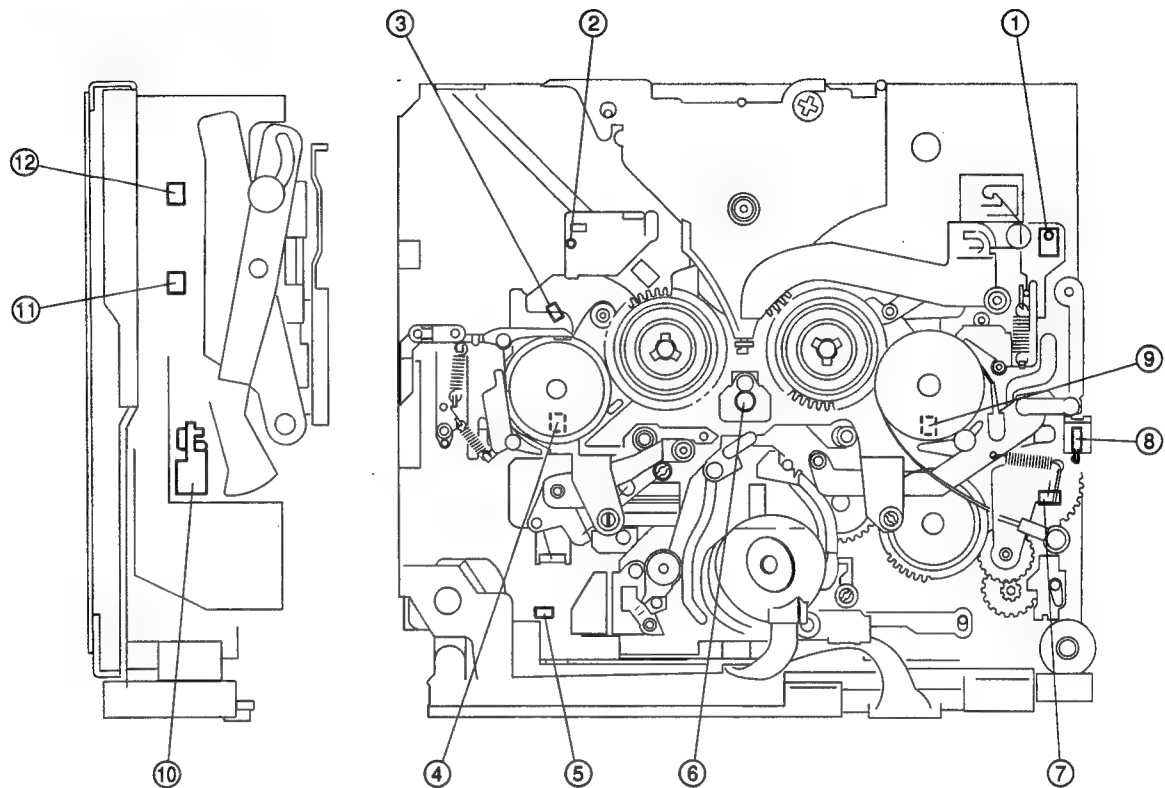


• Main Chassis



- | | | |
|-----------------|----------------------------|-------------------|
| ① AA-104 board | ⑭ DPR-141board | ⑳ PA-220 board |
| ② AT-127 board | ⑮ DU-36 board | ㉑ PA-221 board |
| ③ CC-68 board | ⑯ DV-21 board | ㉒ PS-570 board |
| ④ CN-1519 board | ⑰ ES-26/ES-26P board | ⑳ PSW-71 board |
| ⑤ CN-1811 board | ⑱ FP-118 board | ㉓ SE-511 board |
| ⑥ CN-1823 board | ㉒ FP-99 board | ㉔ SW-18 board |
| ⑦ CN-1864 board | ㉓ GCN-16 board | ㉕ SW-19 board |
| ⑧ CN-1865 board | ㉔ IPM-94 board (DSBK-301A) | ㉖ SW-929 board |
| ⑨ CN-1866 board | ㉕ IV-54 board (DSBK-501) | ㉗ TG-204 board |
| ⑩ CN-1867 board | ㉖ KY-405 board | ㉘ VA-190 board |
| ⑪ CN-1873 board | ㉗ LE-221 board | ㉙ VE-44 board |
| ⑫ CN-1874 board | ㉘ MB-833 board | ㉚ DC-DC converter |
| ⑬ CP-315 board | ㉙ PA-219 board | |

3-1-3. Location of Sensors



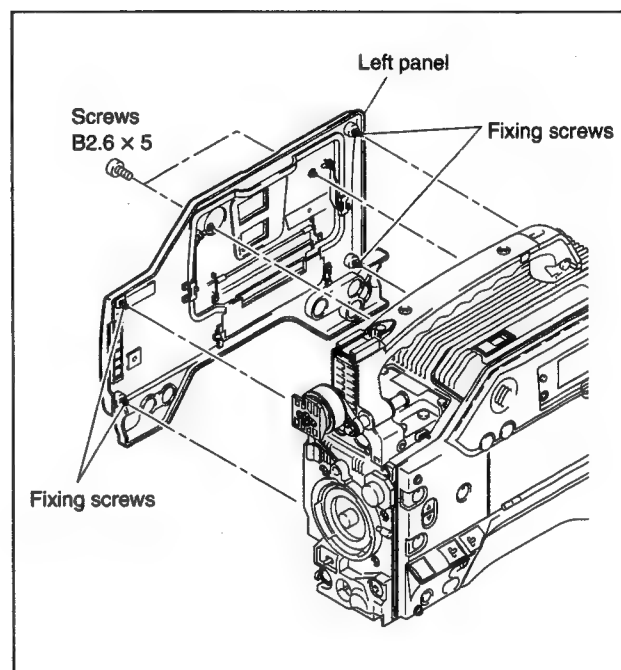
Function of the Sensors

- | | |
|---|---|
| <p>① Cassette compartment lock switch
Detects that the cassette compartment has locked.
Starts threading when the cassette compartment locks from the open state.
During EJECT, EJECT operations end when the cassette compartment opens from the locked state.</p> <p>② False REC detection sensor
Detects the setting position of mis-record-prevention switch of the cassette tape.</p> <p>③ Reel position sensor
Detects the reel position, such as standard cassette position or mini-cassette position.</p> <p>④ Take-up reel FG sensor
Detects the rotation speed of the take-up reel.</p> <p>⑤ Dew sensor
Detects dew condensation in the unit.</p> | <p>⑥ Tape top end sensor (LED)</p> <p>⑦ Mechanical function cam sensor (Cam position sensor)
Detects the movement of the cam whether it is moved to the specified position.</p> <p>⑧ Tape end sensor (sensor)</p> <p>⑨ Supply reel FG sensor
Detects the rotation speed of the supply reel.</p> <p>⑩ Tape top sensor (sensor)</p> <p>⑪ Cassette-In switch
Detects whether a cassette tape is inserted in the cassette compartment.</p> <p>⑫ Cassette identification switch
Detects the size of a cassette tape in the cassette compartment.</p> |
|---|---|

3-2. REMOVING AND ATTACHING THE CABINET

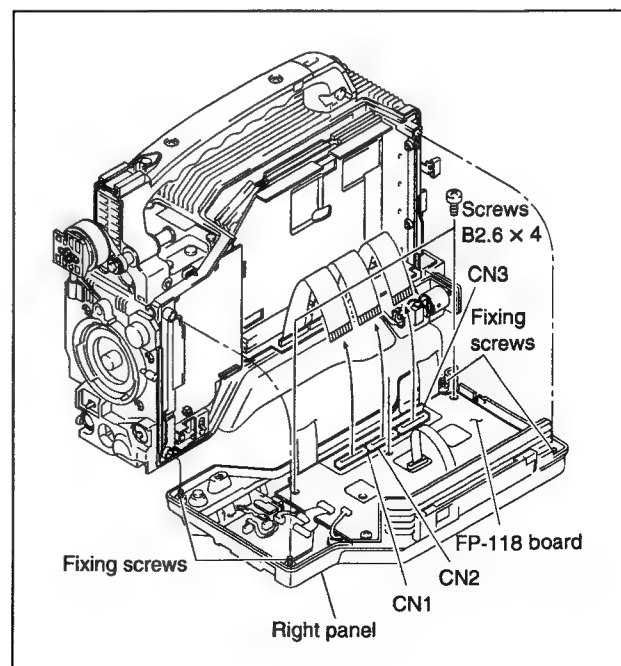
3-2-1. Left Panel and Cassette Compartment Lid

1. Remove the two screws (B2.6 × 5) from the cassette compartment lid.
2. Loosen the four fixing screws and remove the left panel and cassette compartment lid.



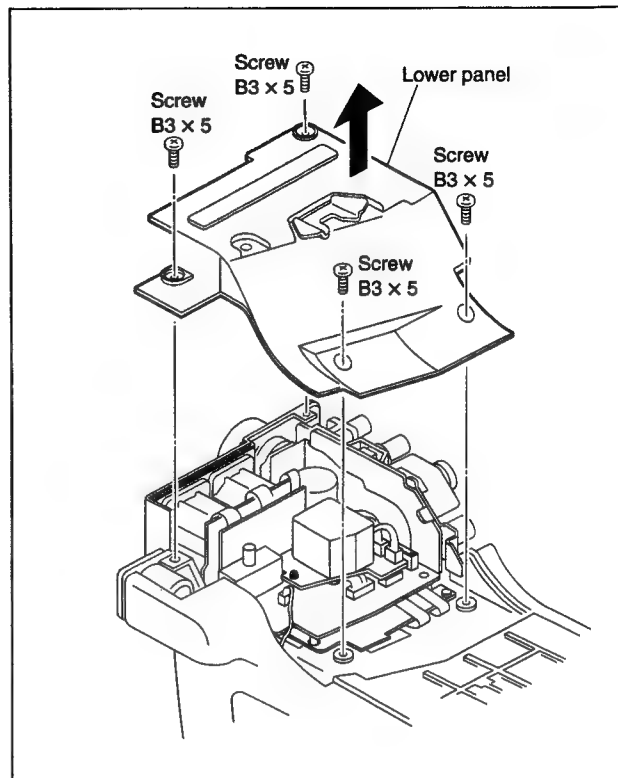
3-2-2. Right Panel

1. Loosen the four screws and open the right panel.
2. Disconnect the three flat cables (CN1, CN2 and CN3) from the FP-118 board.
3. Remove the two screws (B2.6 × 4) and remove the right panel (leave the FP-118 board attached).



3-2-3. Lower Panel

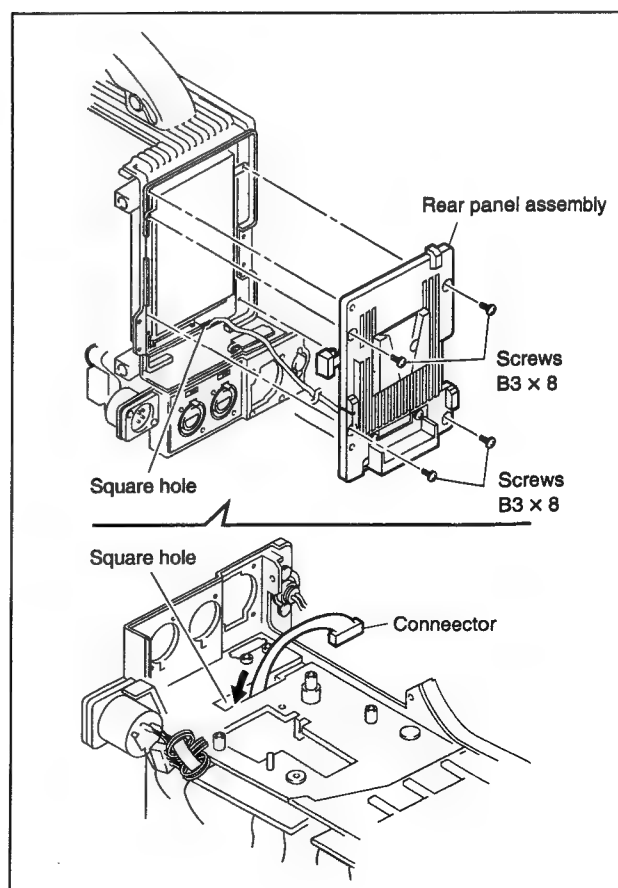
1. Remove the four screws (B3 × 5) and remove the lower panel.



3-2-4. Rear Panel Assembly

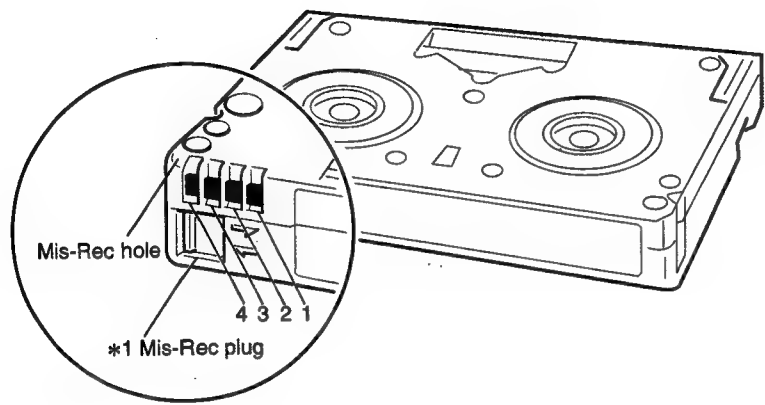
1. Remove the PS-570, CN-1519 and CP-315 boards. (Refer to Sections 3-9-11, 3-9-12, and 3-9-13.)
2. Remove the four screws (B3 × 8) and remove the rear panel assembly.

Point to notice when attaching the rear panel assembly:
Be sure to thread the harness through the square hole of the frame assembly.

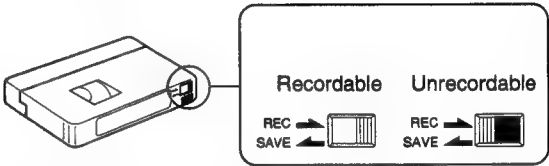


3-3. FUNCTIONS OF CASSETTE

Standard Cassette

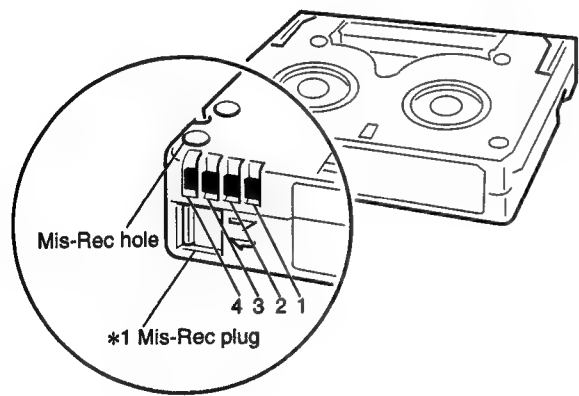


*1 Mis-Rec plug



- Mis-Rec switch is operated by opening or closing of this plug.

Mini Cassette



Pin No.	Function	
	Built-in memory	No Built-in memory
1	+DC	Tape thickness detection
2	DATA	Tape type detection (Ex.: ME/MP)
3	CLOCK	Tape usage detection (Ex.: Consumer/Professional)
4	GND	—

3-4. CIRCUIT STRUCTURE

The DSR-500WS/500WSP is composed of the following boards.

System	Board name	Circuit structure
VIDEO	IPM-94 (DSBK-301A)	INDEX PICTURE
	IV-54 (DSBK-501)	ANALOG COMPOSITE INPUT
AUDIO/VIDEO	AA-104	MIC AMP, VF CONNECTOR
	DPR-141	CAMERA/VIDEO DIGITAL PROCESS
	VE-44	ASPECT RATIO CONVERTER
	DV-21	i.LINK PROCESS
	ES-26/26P	CAMERA/VIDEO ENCODER
	PA-219	CAMERA PREAMP
	PA-220	CAMERA PREAMP
	PA-221	CAMERA PREAMP
	RP-91	REC/PB RF AMP, CHCD (CHANNEL CODING)
	VA-190	CAMERA AGC, WB AMP
	TG-204	CAMERA TIMING GENERATOR
SERVO	CC-68	CASSETTE COMPARTMENT SWITCH, TAPE TOP SENSOR
	HN-227	SERVO MECHANISM DECK INTERFACE
	MT-114	REEL SHIFT MOTOR/SWITCH
	SE-295	FUNCTION CAM SENSOR, TAPE END SENSOR
	SE-297	REEL FG SENSOR, REEL SHIFT SENSOR, CASSETTE COMPARTMENT LOCK SWITCH
	SE-298	MIC, REC INHIBIT SWITCH
	SV-213	SERVO
SYSCON	AT-127	CAMERA MICROCOMPUTER
	FP-118	RIGHT PANEL SWITCH, VIDEO MICOM., ANALOG AUDIO, LCD
CONNECTOR	CN-1864	2/3 LENS CONNECTOR
	CN-1865	RM CONNECTOR
	CN-1866	RM JACK
	CN-1519	CCZ FLEXIBLE CARD
	CN-1811	
	CN-1823	DV CONNECTOR
	CN-1867	EARPHONE JACK
	CN-1873	+12 V DC CONNECTOR
	CN-1874	ANTON CONNECTOR
	CP-315	REAR CONNECTOR BOX
SWITCH	FP-99	RIGHT PANEL SWITCH
	GCN-16	GAIN SWITCH
	KY-405	VIDEO CONTROL SWITCH
	PSW-71	AWB/ABB SWITCH, POWER SWITCH
	SW-19	SHUTTER SWITCH
	SW-18	EDIT SEARCH SWITCH
	SW-929	ROTARY SWITCH

System	Board name	Circuit structure
OTHERS	DU-36	MECHANICAL BACK-UP
	LE-221	BACK TALLY LED
	MB-833	CAMERA/VIDEO MOTHER BOARD
	PS-570	VIDEO LIGHT, DC-DC CONVERTER
	SE-511	FILTER DISC DETECTOR

3-5. NOTES ON TIGHTENING SCREWS

1. Attaching Screw to the Chassis

This unit has a small and light design, and uses numerous M1.4 × 2.5 (1.4 mm diameter), M2 × 5, and M2 × 6 (2 mm diameter) screws.

When tightening the above screws, be very careful of the tightening torque. In order to prevent the chassis's screw-hole from damage against the excessive tightening torque, be sure to use the following torque screwdriver and torque screwdriver bits.

<u>Tools</u>	<u>Sony Part No.</u>
Torque screwdriver	J-6325-400-A
Torque screwdriver bit (For M1.4)	J-6325-110-A
Torque screwdriver bit (For M2)	J-6325-380-A

<u>Screws</u>	<u>Tightening torque</u>
For M1.4 screws	0.09 ±0.01 N·m (0.9 ±0.1 kgf·cm)
For M2 screws	0.19 ±0.03 N·m (1.9 ±0.3 kgf·cm)

The above torque screwdrivers can be used for both M1.4 and M2 screws.

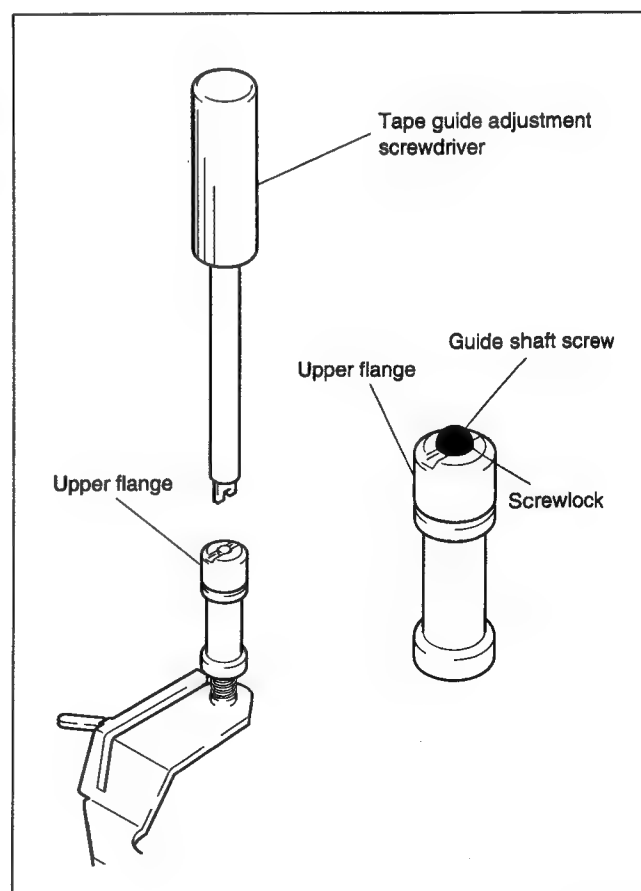
2. Screwlocking of Tape Guide's Upper Flange

When performing the tape guide height adjustment during tape path adjustment, use the following tape guide adjustment screwdriver.

After adjusting the tape guide height, apply screwlocking compound to the upper flange of tape guide and tapped Section of guide shaft screw.

<u>Tools</u>	<u>Sony Part No.</u>
Tape guide adjustment screwdriver	J-6082-362-A
Screwlocking compound (Three-bond 1401B)	7-432-114-11

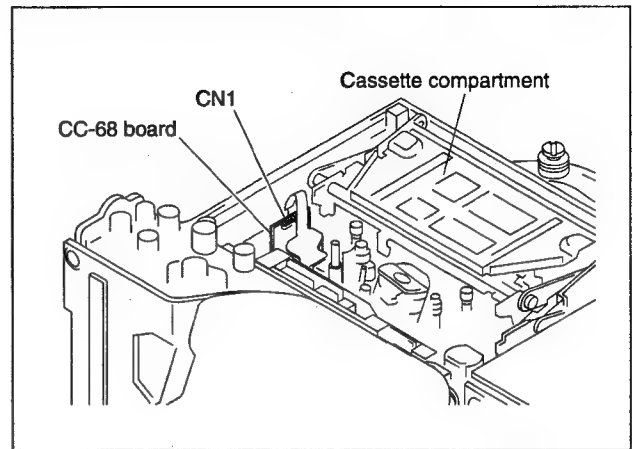
Point to notice when applying the screwlocking compound:
Do not apply screwlocking compound to the guides along the tape running surface.



3-6. OPERATING THE UNIT WITHOUT LOADING A CASSETTE TAPE

1. Turn off the power switch.
2. Remove the left panel and cassette compartment lid.
(Refer to Section 3-2-1.)
3. Disconnect connector CN1 from the CC-68 board.
4. Set the SLACK DETECTION ON/OFF switch
(S500-4/SV-213 board) to off.
5. Turn on the power switch.
6. Press the desired mode button.

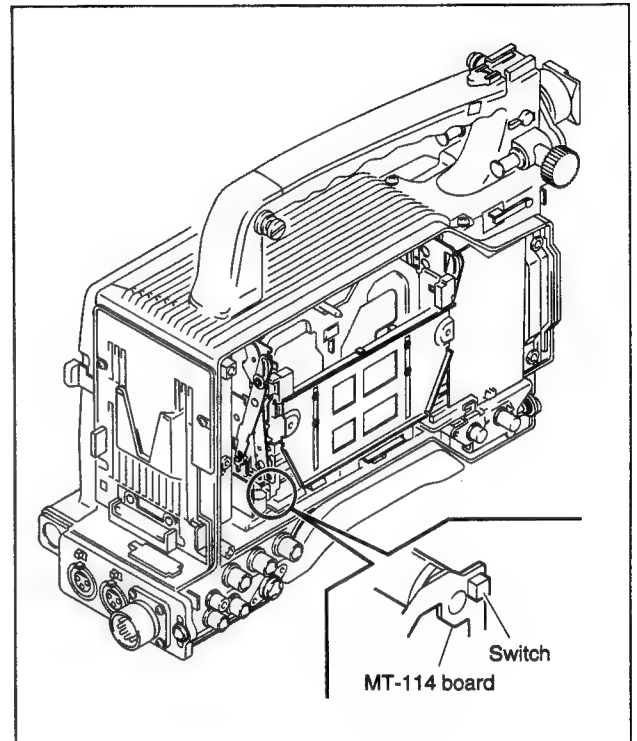
Note: Set the SLACK DETECTION ON/OFF switch
(S500-4 / SV-213 board) to on, after operation.



3-7. SHIFTING THE REEL

3-7-1. When the power can be turned ON

1. Turn off the power switch.
2. Remove the left panel and cassette compartment lid. (Refer to Section 3-2-1.)
3. Disconnect the connector CN1 from the CC-68 board.
4. Turn on the power switch.
5. Press the EJECT button to set the unit in EJECT state.
6. Press the switch on the MT-114 board. The reel is shifted alternately between the standard cassette position and mini cassette position every time you press the switch.

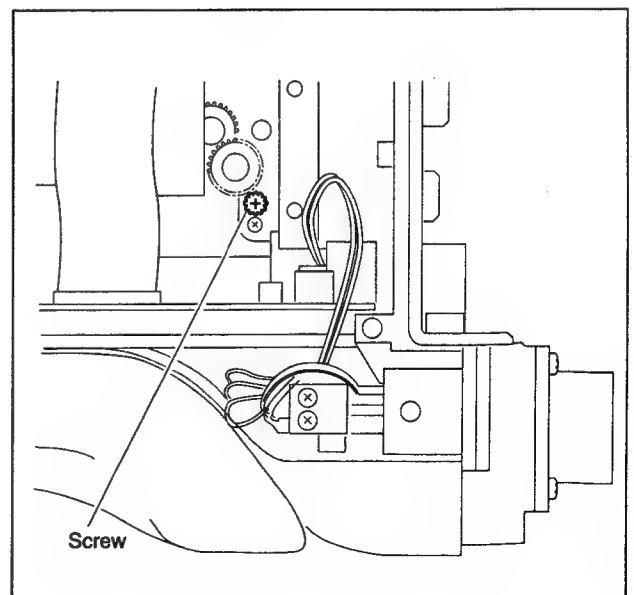


3-7-2. When the power cannot be turned ON

1. Open the right panel. (Refer to Section 3-2-2.)
2. Remove the DPR-141 and ES-26/26P boards. (Refer to Section 3-9-4.)
3. Remove the two screws (B2.6 × 4) and remove the dust-proof sheet. (Refer to step 2 of Section 3-9-5.)
4. Turn the screw as shown in the figure.
Clockwise direction: Standard cassette position
Counterclockwise direction: Mini cassette position

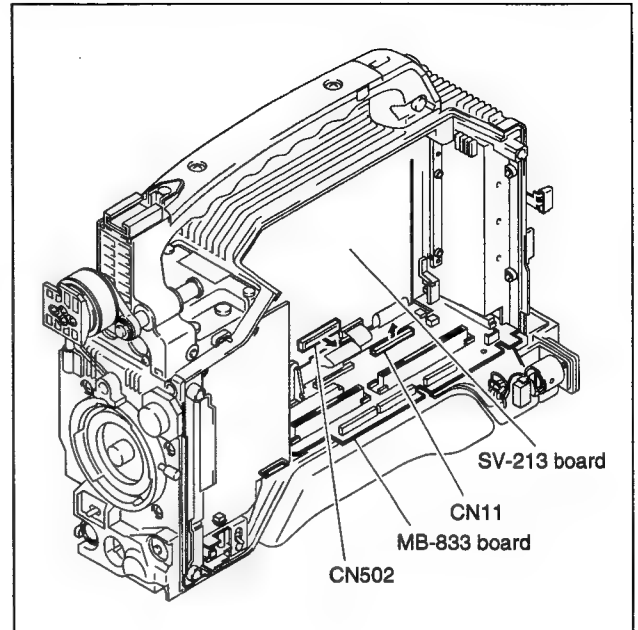
Note 1: Do not turn the screw with excessive force.

Note 2: Do not use this screw frequently.

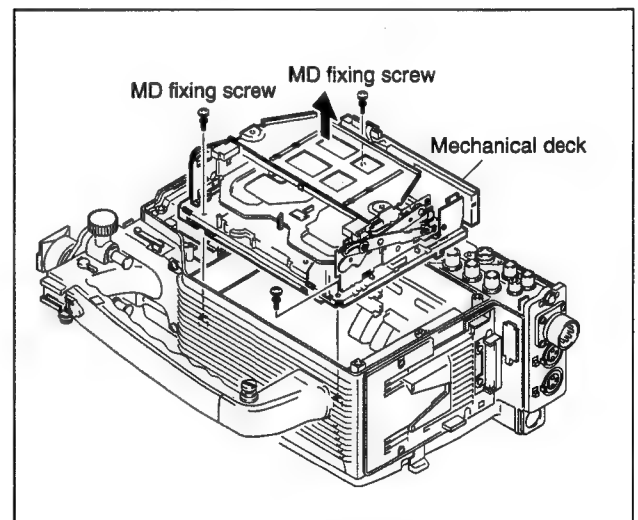


3-8. REMOVAL OF MECHANICAL DECK

1. Open the right panel. (Refer to Section 3-2-2.)
2. Remove the ES-26/26P and DPR-141 boards. (Refer to Section 3-9-4.)
3. Remove the DU-36 board. (Refer to Section 3-9-5.)
4. Remove the flat cables CN502 from the SV-213 board and CN11 from the MB-833 board.



5. Remove the two screws (B2.6 × 4) and open the AT-127 board. (Refer to Section 3-9-6.)
6. Remove the left panel and cassette compartment lid. (Refer to Section 3-2-1.)
7. Remove the three screws (MD fixing screws) and pull out the mechanical deck in the arrow direction.



3-9. REMOVING AND ATTACHING THE BOARDS

3-9-1. FP-118 Board

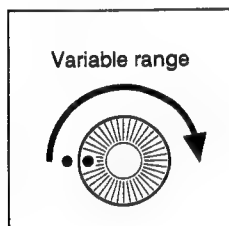
Point to notice when removing the FP-118 board:

In order to protect the stored data inside the board, power line of this unit is always activated even if the power switch is turned off. As the data inside the FP-118 board is backed up by the lithium battery, IC chips on the FP-118 board may damage by the usual service activity. Therefore, be sure to remove the lithium battery inside the TC panel before removing the FP-118 board.

1. Remove the lithium battery from the TC panel.
2. Remove the four knobs and four knob spacers.
3. Remove the right panel. (Refer to Section 3-2-2.)

Point to notice when installing the knob spacers:

1. Be sure to put a knob spacer behind the knob.
2. Align the dot mark on the knob with the dot mark on the unit.

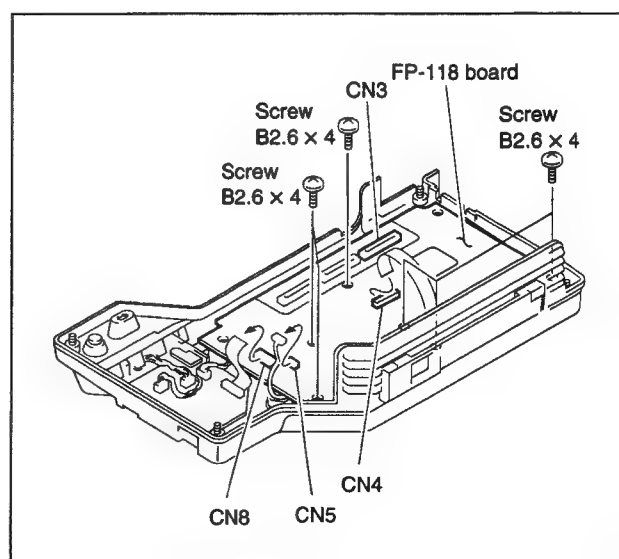
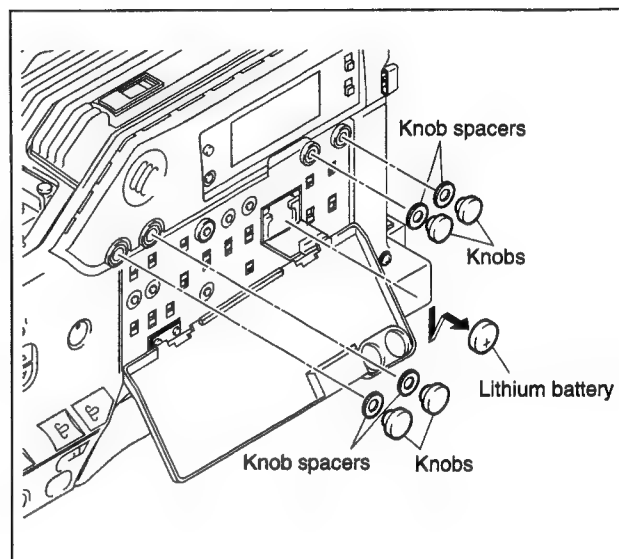


4. Disconnect the two flat cables (CN4 and CN8) and a connector (CN5) from the FP-118 board.
5. Remove the six screws (B2.6 × 4) and remove the FP-118 board.

Point to notice after replacing the FP-118 board:

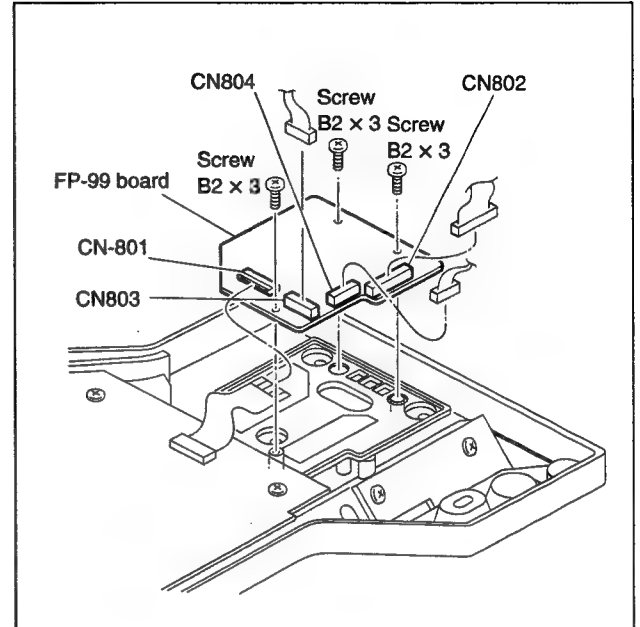
Be sure to make presetting of the KY EEPROM's echo-back data. (Refer to Section 3-18-4.)

Maintenance information is stored inside the EEPROM on the FP-118 board. The same data is stored inside the EEPROM on the HN-227 board as an echo-back data. To write the lost data in EEPROM on the FP-118 board after the FP-118 board replacement, carry out the KY EEPROM ECHO BACK DATA PRESET in menu No. 752.



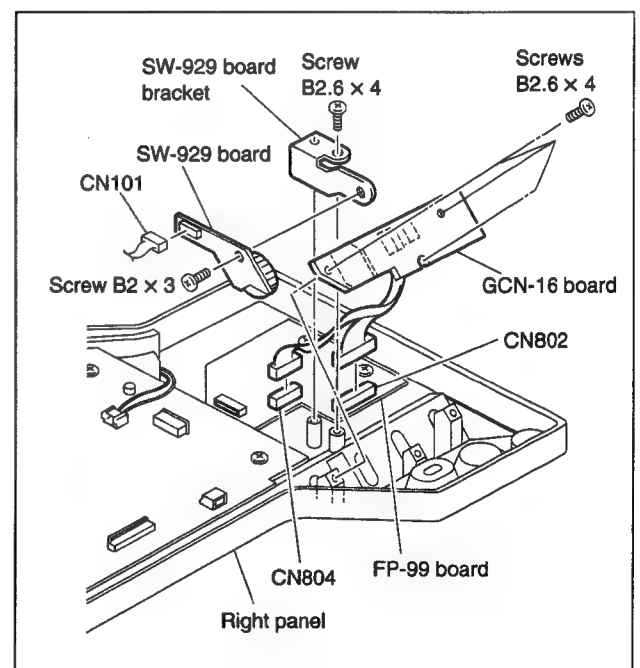
3-9-2. FP-99 Board

1. Open the right panel. (Refer to Section 3-2-2.)
2. Disconnect the flat cable (CN801) and the three connectors (CN802, CN803, and CN804) from the FP-99 board.
3. Remove the three screws (B2 × 3) and remove the FP-99 board.



3-9-3. GCN-16 and SW-929 Boards

1. Remove the right panel. (Refer to Section 3-2-2.)
2. Disconnect the two connectors (CN802 and CN804) from the FP-99 board.
3. Remove the three screws (B2.6 × 4) and remove the GCN-16 board.
4. Disconnect the a connector (CN101) from the SW-929 board.
5. Remove the screw (B2.6 × 4) and remove the SW-929 board together with bracket.
6. Remove the screw (B2 × 3) and remove the SW-929 board.



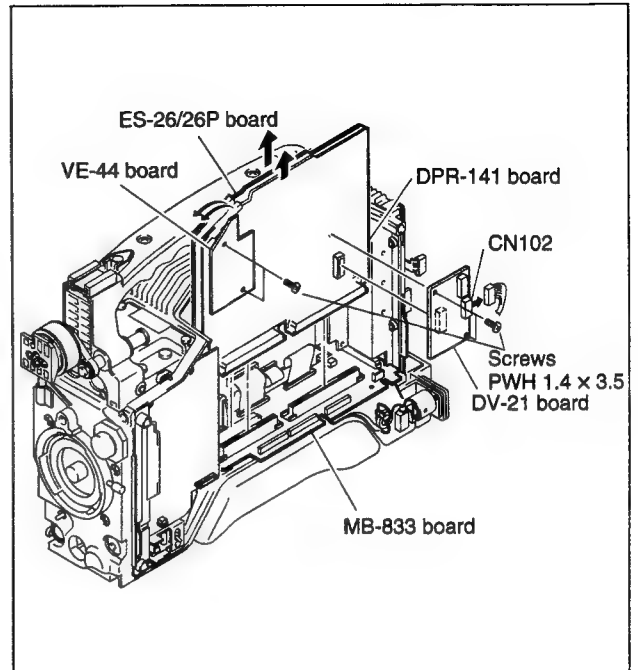
3-9-4. DPR-141, ES-26/26P, DV-21 and VE-44 Boards

1. Open the right panel. (Refer to Section 3-2-2.)
2. Disconnect the connector CN102 on the DV-21 board.
3. Open the board lever of the DPR-141 and ES-26/26P boards in the arrow direction, and pull out the DPR-141 and ES-26/26P boards.
4. Remove the two screws (PWH1.4 × 3.5), then pull out the DV-21 board from the connector on the DPR-141 board.
5. Remove the two screws (PWH1.4 × 3.5), then pull out the VE-44 board from the connector on the DPR-141 board.

Point to notice when attaching the board:

Insert the board along the right and left sides of rails until it securely comes in contact with the MB-833 board.
Take care that the harness is not caught.

Note: Be sure to perform menu's "Page 24 Memory Backup" after the DPR-141 and ES-26/26P boards replacement. (Refer to Section 5-2-3.) when replacing the DR-141 board only, reset serial No. using the No.522 in service menu. (Refer to Section 5-1-2.)

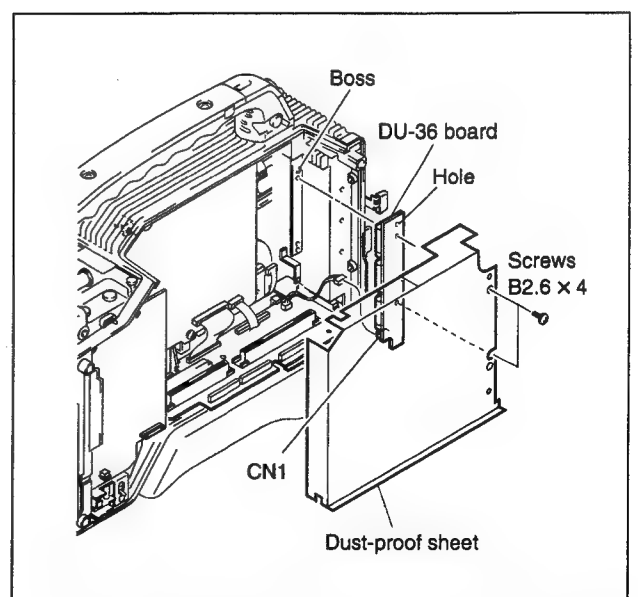


3-9-5. DU-36 Board

1. Remove the DPR-141 and ES-26/26P boards. (Refer to Section 3-9-4.)
2. Remove the two screws (B2.6 × 4) and remove the dust-proof sheet.
3. Disconnect the connector CN1 from the DU-36 board, then remove the DU-36 board.

Point to notice when attaching the board:

Align the hole of the DU-36 board with a boss portion of the frame assembly.



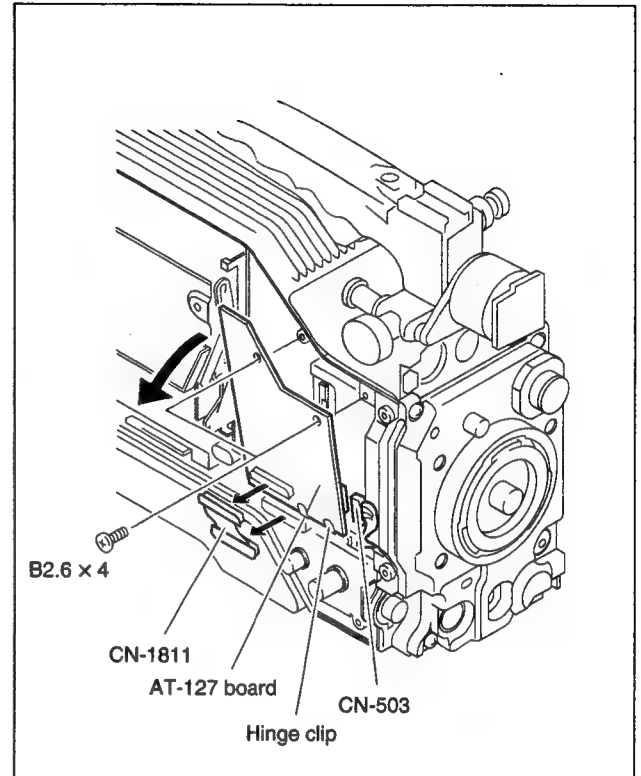
3-9-6. AT-127 Board

1. Remove the left panel and cassette compartment lid. (Refer to Section 3-2-1.)
2. Disconnect the connector CN503 from the AT-127 board and remove the two screws (B2.6 × 4).
3. Disconnect the CN-1811 flexible board from the AT-127 board. While picking the two board hinge clips, remove the AT-127 board.

Point to notice when attaching the board:

Align the board hinge clip with hole.

When removing, take care that the connector of CN-1811 board is not twisted.

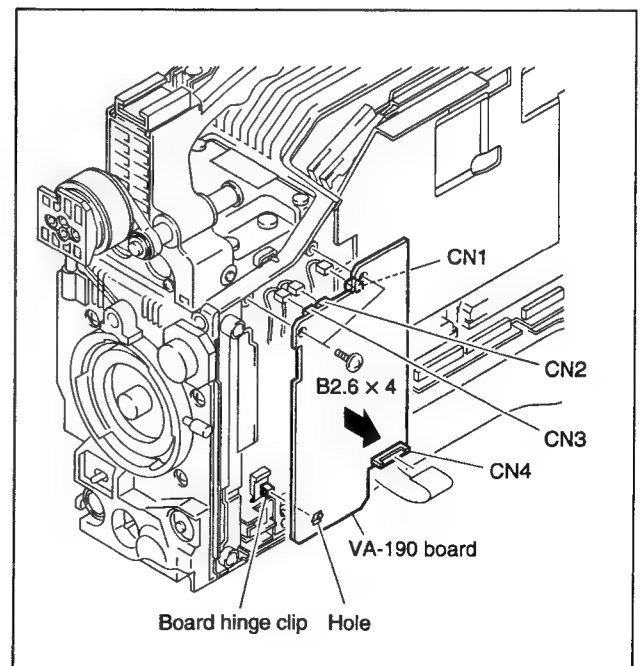


3-9-7. VA-190 Board

1. Open the right panel. (Refer to Section 3-2-2.)
2. Disconnect the flat cable (CN4) and the three connectors (CN1, CN2, and CN3) from the VA-190 board.
3. Remove the two screws (B2.6 × 4). While picking the board hinge clip, remove the VA-190 board.

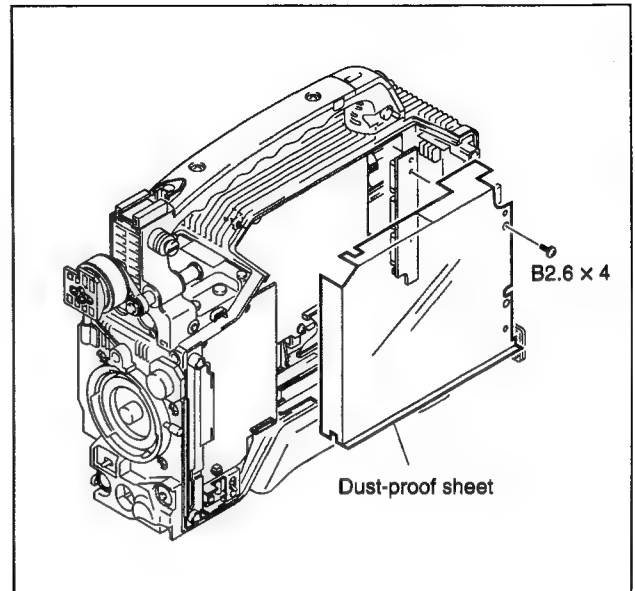
Point to notice when attaching the board:

Align the board hinge clip with hole.



3-9-8. SV-213 Board

1. Open the right panel. (Refer to Section 3-2-2.)
2. Remove the ES-26/26P and DPR-141 boards.
(Refer to Section 3-9-4.)
3. Remove the screw (B2.6 × 4) and remove the dust-proof sheet.



4. Disconnect the two flat cables (CN501 and CN502) and two flexible cards (CN504 and CN505) from the SV-213 board.
5. Remove the three screws (PWH1.4 × 2.5), disconnect the connector CN500, and remove the SV-213 board.

Point to notice when disconnecting the connector:

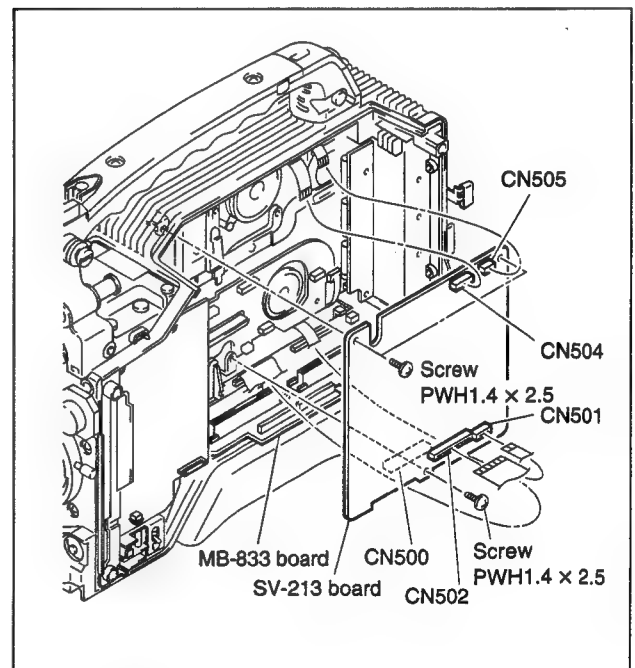
In order to prevent the board from damage, pull out the connector CN500 gradually.

Point to notice when connecting the connector:

Be sure not to apply excessive force to the component side of the SV-213 board when connecting the connector CN500.

Point to notice when removing/installing the board:

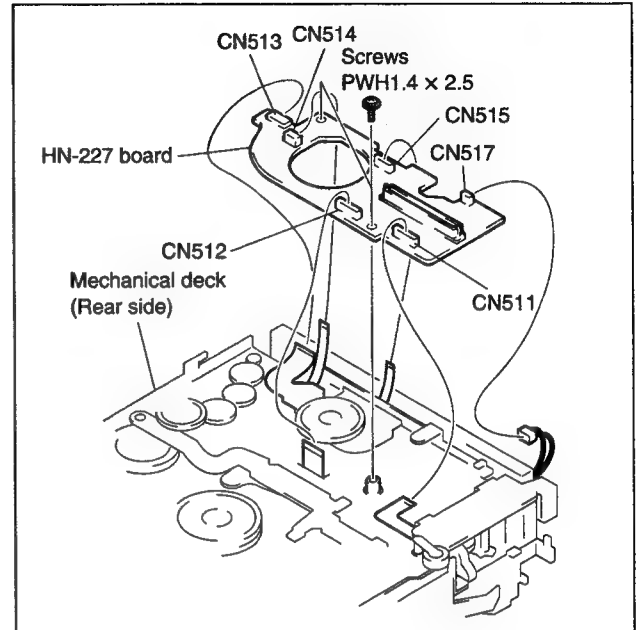
Be very careful not to damage the connectors, harnesses, and flexible card boards that are connected to the MB-833 board.



3-9-9. HN-227 Board

1. Remove the mechanical deck. (Refer to Section 3-8.)
2. Remove the SV-213 board. (Refer to steps 4 and 5 of Section 3-9-8.)
3. Disconnect the five flexible cards (CN511, CN512, CN513, CN514, and CN515) from the HN-227 board.
4. Disconnect the connector CN517 from the HN-227 board.
5. Remove the two screws (PWH1.4 × 2.5) and remove the HN-227 board.

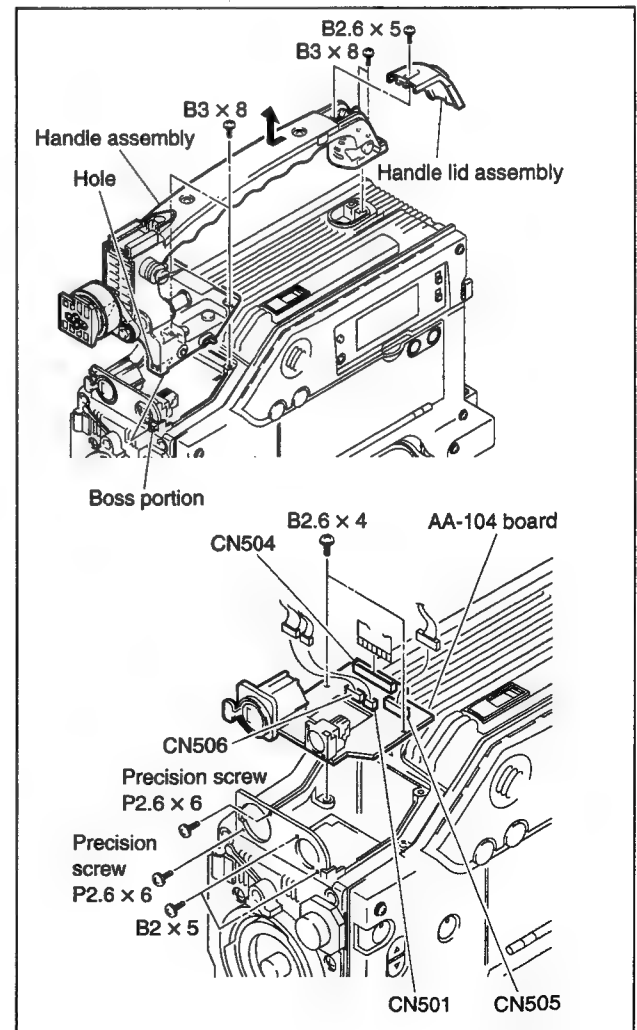
Note: When replacing the HN-227 board, remove IC1 from the former HN-227 board, then mount it on the new HN-227 board.



3-9-10. AA-104 Board

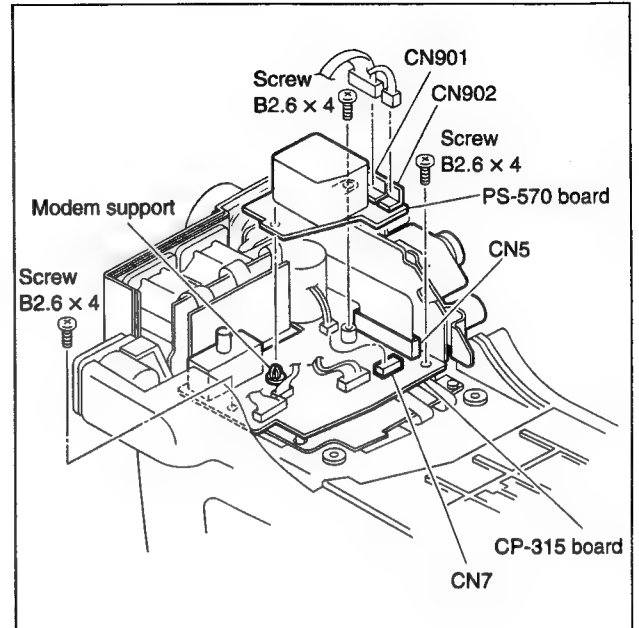
1. Remove the ES-26/26P and DPR-141 boards. (Refer to Section 3-9-4.)
2. Remove the screw (B2.6 × 5) and remove the handle lid assembly.
3. Remove the four screws (B3 × 8) and remove the handle assembly in the arrow direction.

Point to notice when attaching the board:
Align the boss portion with square hole when installing the handle assembly.



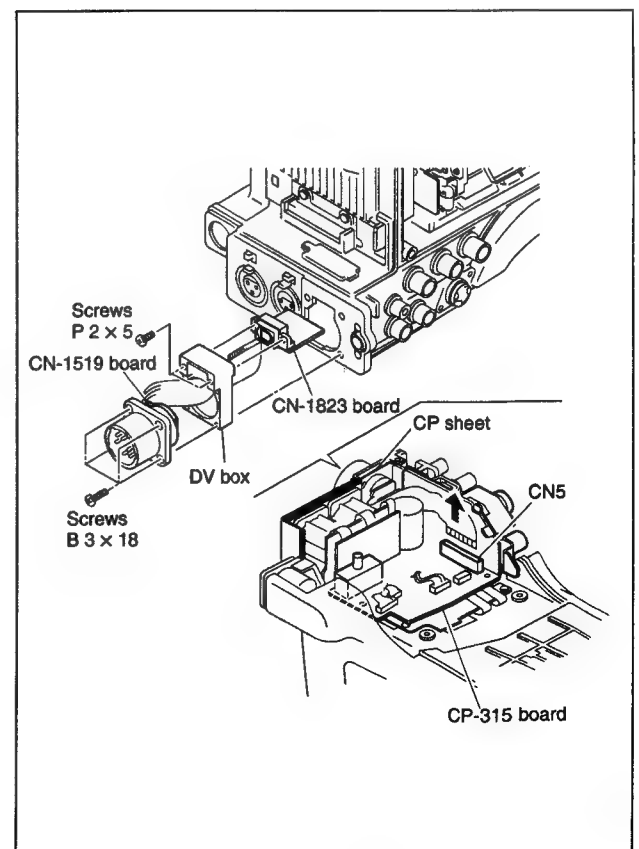
3-9-11. PS-570 Board

1. Remove the lower panel. (Refer to Section 3-2-3.)
2. Disconnect the two connectors (CN901 and CN902) from the PS-570 board. Disconnect the connector CN7 from the CP-315 board.
3. Remove the screw (B2.6 × 4). While picking the modem support, remove the PS-570 board.



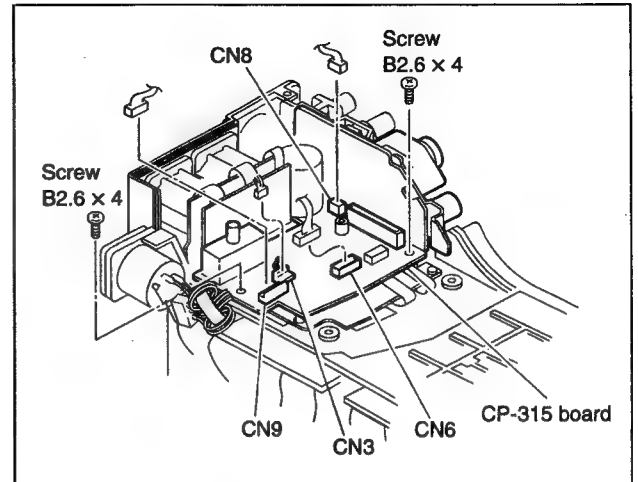
3-9-12. CN-1519 and CN-1823 Board

1. Remove the lower panel. (Refer to Section 3-2-3.)
2. Remove the PS-570 board. (Refer to Section 3-9-11.)
3. Disconnect the flexible card CN5 from the CP-315 board and remove the four screws (B3 × 18).
4. While opening the CP sheet, remove the CN-1519 board.
Be careful that the flexible board does not touch the chassis to prevent it from damage.
5. Disconnect the connector CN102 on the DV-21 board. (Refer to Section 3-9-4.)
6. Remove the two precision screws (P2 × 5), then remove the CN-1823 board.

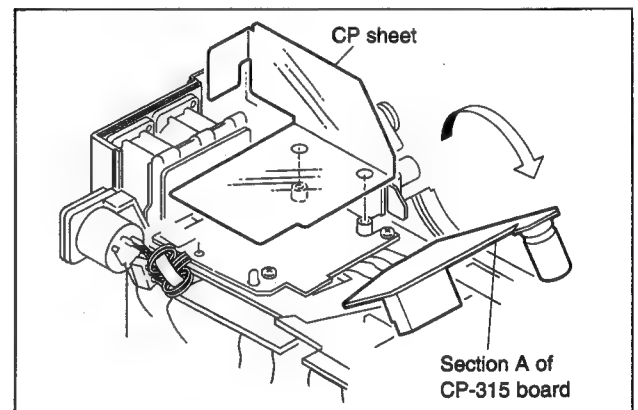


3-9-13. CP-315 Board

1. Remove the left panel, right panel, CN-1519 board, and PS-570 board.
(Refer to Sections 3-2-1, 3-2-2, 3-9-11, and 3-9-12.)
2. Disconnect the four connectors (CN3, CN6, CN8 and CN9) and remove the two screws (B2.6 × 4) from the CP-315 board.



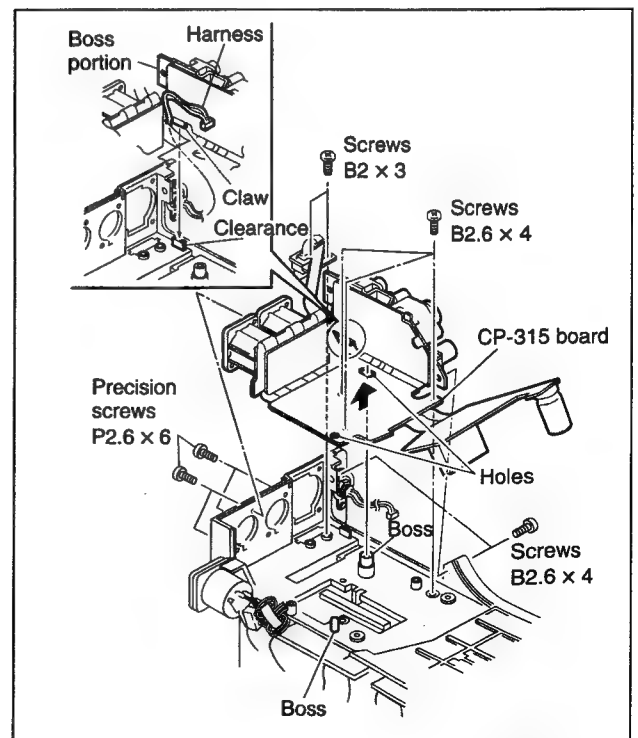
3. While opening Section A of the CP-315 board in the arrow direction, remove the CP sheet.



4. Remove the nine screws (B2.6 × 4, precision screw P2.6 × 6, and B2 × 3).
5. Remove the CP-315 board in the arrow direction.

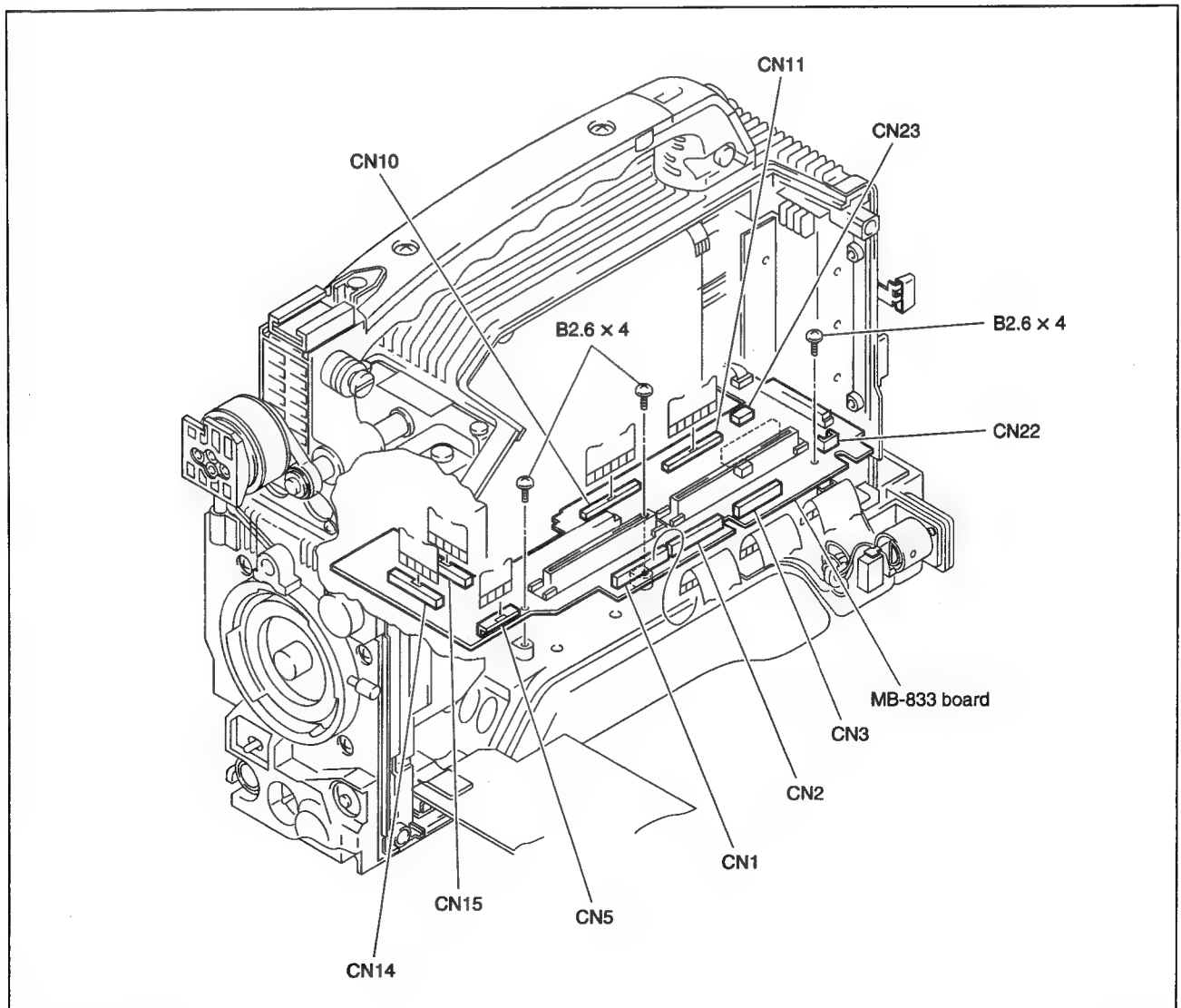
Point to notice when attaching the board:

1. Be sure to insert the claw into clearance.
2. Be sure to pass the harness through underneath boss portion.



3-9-14. MB-833 Board

1. Remove the left and right panels.
(Refer to Sections 3-2-1 and 3-2-2.)
2. Remove the rear panel assembly and DC-DC converter.
(Refer to Section 3-2-4 and 7-35.)
3. Remove the ES-26/26P, DPR-141, AT-127, VA-190, CN-1519, PS-570, and CP-315 boards. (Refer to Sections 3-9-4, 3-9-6, 3-9-7, 3-9-11, 3-9-12, and 3-9-13.)
4. Remove the screw (B2.6 × 4), and remove the dust-proof sheet. (Refer to Section 3-9-8.)
5. Disconnect the two connectors (CN22 and CN23) and eight flat cables (CN1, CN2, CN3, CN5, CN10, CN11, CN14, and CN15) from the MB-833 board.
6. Remove the three screws (B2.6 × 4) and remove the MB-833 board.

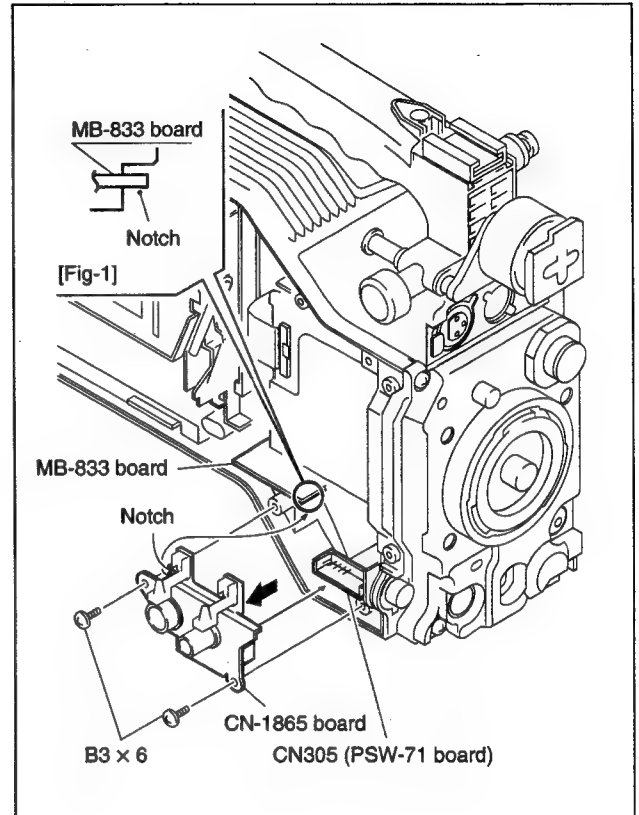


3-9-15. CN-1865 Board

1. Remove the left panel and remove the AT-127 board.
(Refer to Sections 3-2-1 and 3-9-6.)
2. Remove the two screws (B3 × 6) and remove the CN-1865 board in the arrow direction.

Point to notice when attaching the board:

Align the MB-833 board with notch and insert the CN-1865 board to CN305 on the PSW-71 board.

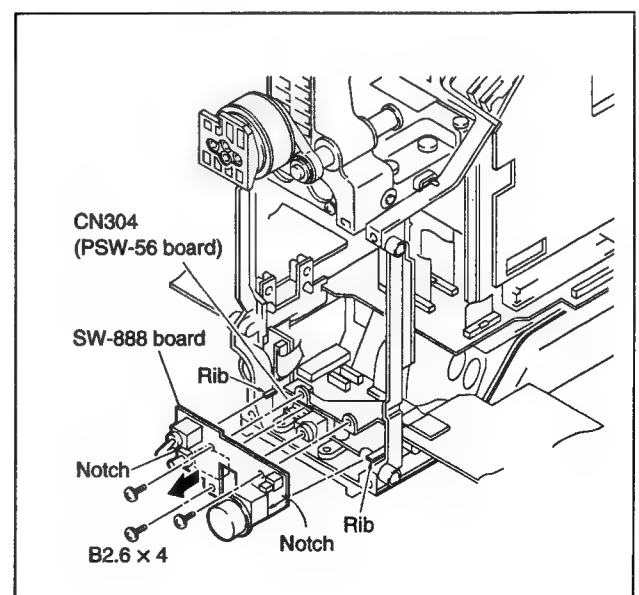


3-9-16. SW-19 Board

1. Remove the front unit assembly. (Refer to Section 7-34.)
2. Remove the three screws (B2.6 × 4) and remove the SW-19 board in the arrow direction.

Point to notice when attaching the board:

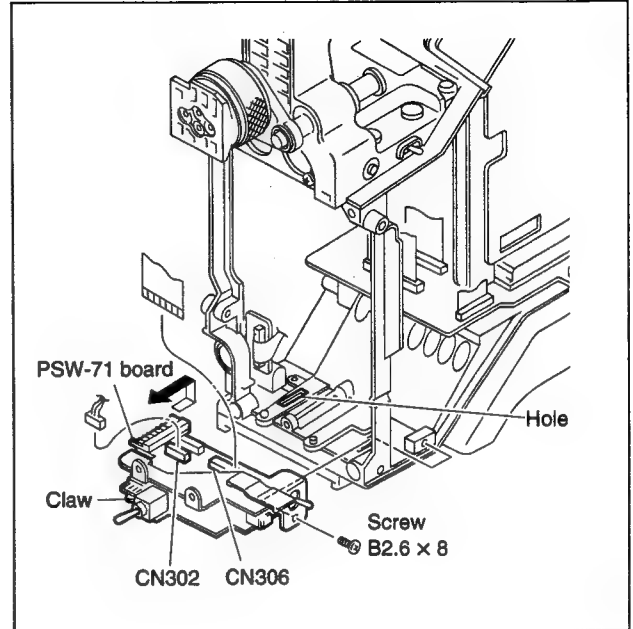
Align the two notches with ribs and insert the SW-19 board to CN304 on the PSW-56 board.



3-9-17. PSW-71 Board

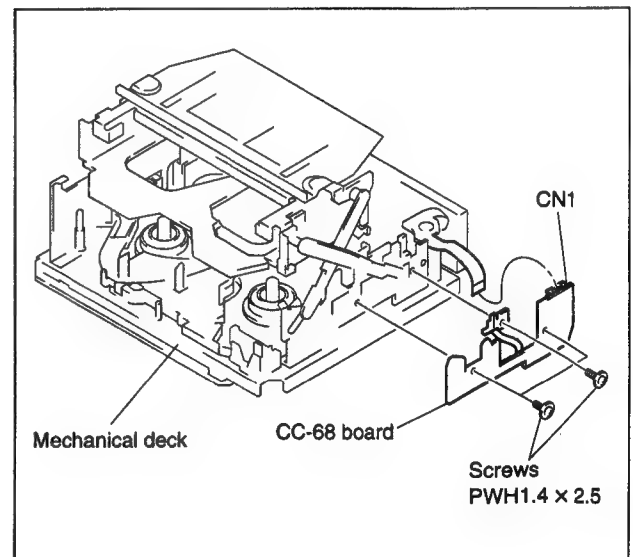
1. Remove the CN-1865 and SW-19 boards.
(Refer to Sections 3-9-15 and 3-9-16.)
2. Remove the screw (B2.6 × 8).
3. Disconnect the flat cable (CN306) and connector (CN302) from the PSW-71 board, and remove the PSW-71 board in the arrow direction.

Point to notice when attaching the board:
Be sure to hook the claw to the hole.



3-9-18. CC-68 Board

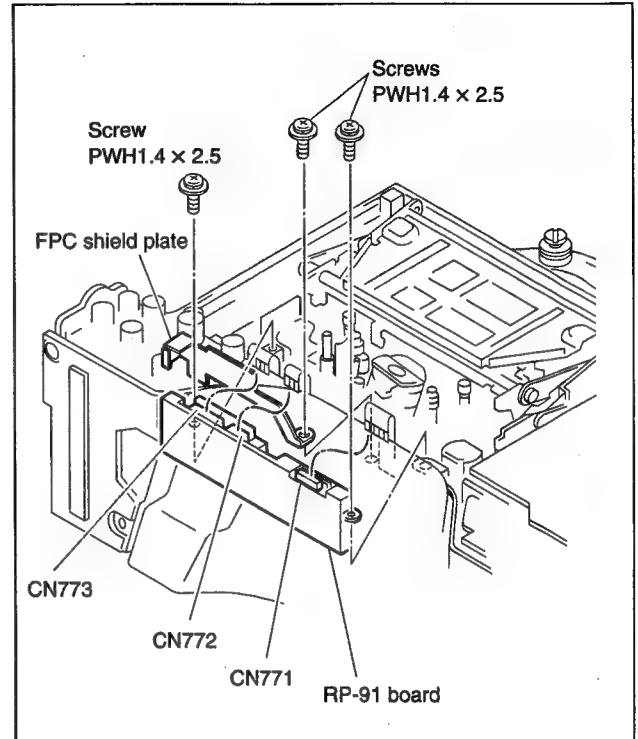
1. Remove the mechanical deck. (Refer to Section 3-8.)
2. Disconnect the flexible card (CN1) from the CC-68 board.
3. Remove the two screws (PWH1.4 × 2.5) and remove the CC-68 board.



3-9-19. RP-91 Board

1. Remove the left panel. (Refer to Section 3-2-1.)
2. Disconnect the flexible card (CN771) and the two flat cables (CN772 and CN773).
3. Remove the three screws (PWH1.4 × 2.5) and remove the FPC shield plate and the RP-91 board.

Note: Be sure to perform Section 11 VTR Block Electrical Alignment after the replacement of RP-91 board.

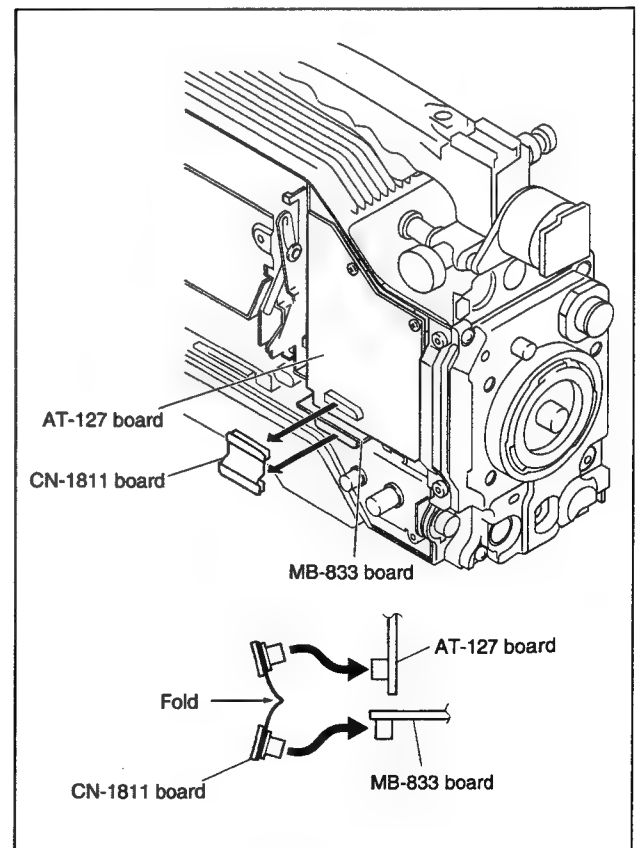


3-9-20. CN-1811 Board

1. Remove the left panel and cassette compartment lid. (Refer to Section 3-2-1.)
2. Disconnect the connectors from the AT-127 and MB-833 boards and remove the CN-1811 board.

Point to notice when attaching the board:

When attaching a new one, make a fold at the central part of the flexible board in the direction shown in the figure.

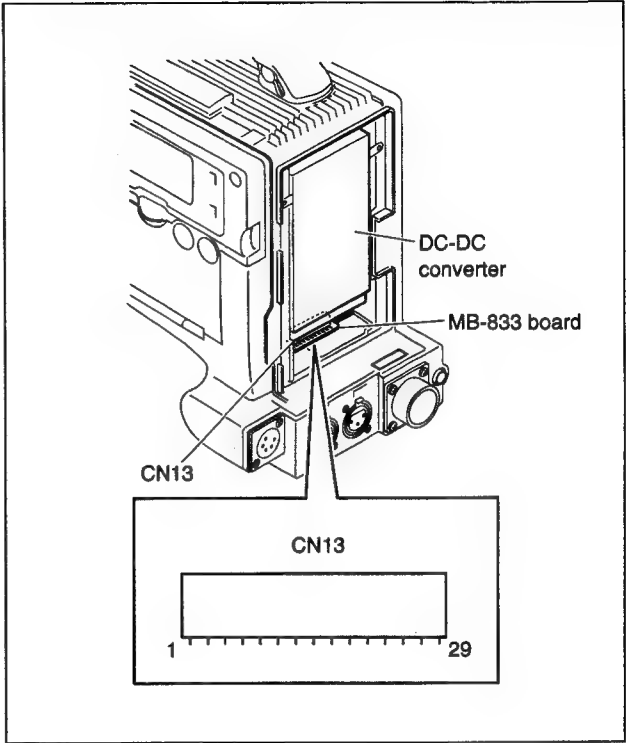


3-10. DC-DC CONVERTER VOLTAGE
CONFIRMATION

Output voltages of the DC-DC converter can be checked at the test points on the MB-833 board and front MIC connector.

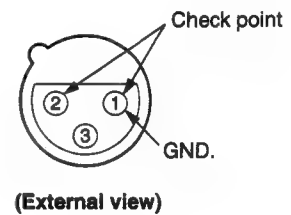
- Connector CN13 of MB-833 Board
To measure the voltages, remove the four screws and open the rear panel.

Check point	Voltage
Pin 1	SWD EXT DC
Pin 3	UNREG GND
Pin 7	+3.4 V
Pin 9	+3.1 V
Pin 13	-5 V
Pin 15	+5.0 V
Pin 17	+5.3 V
Pin 19	+6.6 V
Pin 21	+9.0 V
Pin 25	+6.0 V
Pin 29	+16.1 V



- Front MIC Connector

Check point	Voltage
Pin 2/Pin 1 (GND)	+48 V



3-11. CONNECTING CONNECTORS

When connecting cables to connectors in installation and servicing, attach the following connectors or equivalent product to the tip of the cables.

Panel display	Connecting connector
CH-1/CH-2 AUDIO IN (+48 V)	1-508-084-00 CONNECTOR, XLR 3P, MALE
DC IN	1-508-362-00 CONNECTOR, XLR 4P, FEMALE
TC IN/OUT	1-560-069-11 CONNECTOR, BNC, MALE
GENLOCK IN	1-560-069-11 CONNECTOR, BNC, MALE
MONITOR OUT	1-560-069-11 CONNECTOR, BNC, MALE
EAR PHONE	PLUG, MINI, STEREO
DC OUT (+12 V)	1-566-425-11 PLUG, 4P, MALE
CH-1/CH-2 AUDIO OUT	1-506-311-00 RCA PIN, MALE
S-VIDEO OUT	S-VIDEO CONNECTOR CABLE (Option): YC-30 V (3 m) YC-15 V (1.5 m)
REMOTE (10P, FEMALE)	1-506-522-11 CONNECTOR, ROUND 10P, MALE HIROSE HR 10A-10P-10P or equivalent or CCA-7-20 Cable assembly (Sold separately)
VIDEO OUT (BNC)	1-560-661-11 PLUG, BNC
LENS (12P, FEMALE)	1-564-360-11 CONNECTOR, 12P, MALE HIROSE HR 10-10PA-12P or equivalent
MIC (3P, FEMALE)	1-508-084-31 CONNECTOR, 3P, MALE CANNON XLA-3-12C or equivalent
VF (20P, FEMALE)	1-778-661-11 CONNECTOR, 20P, MALE HIROSE HR 12-14PA-20PC or equivalent
EXT VTR (26P, MALE)	1-564-184-21 PLUG, CONNECTOR (SOCKET) 26P FEMALE • For 14P-VTR use CCZQ-A2 (2 m) CCZQ-A5 (5 m) CCZQ-A10 (10 m) • For 26P-VTR use CCZ-A2 (2 m) CCZ-A5 (5 m) CCZ-A10 (10 m)
WRR (7P, FEMALE)	1-569-200-11 CONNECTOR, 7P, MALE
BATTERY (5P, MALE)	1-784-815-11 PLUG, 5P, FEMALE

Panel display	Connecting connector
i.LINK.	DV Cable (6P-4P) : CCFD-3L DV Cable (6P-6P) : CCF-3L

3-12. INPUT/OUTPUT SIGNALS OF CONNECTORS

Inputs

GENLOCK IN: BNC type
1.0 Vp-p, 75 Ω , sync negative

TC IN: BNC type
0.5 to 18 Vp-p, 10 k Ω

AUDIO 1/2 IN: XLR 3P
– 60 dBu, Zi \geq 3 k Ω / + 4 dBu,
10 k Ω balanced

Outputs

MONITOR OUT: BNC type

VIDEO OUT: BNC type
1.0 Vp-p, 75 Ω , sync negative

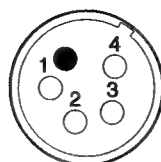
TC OUT: BNC type
1.0 Vp-p, 75 Ω

EAR PHONE: $-\infty$ to –15.5 dBu variable, 8 Ω
(Stereo mini jack)

AUDIO 1/2: RCA PIN –10 dBu, 47 k Ω

i.LINK: 6P, IEEE 1394

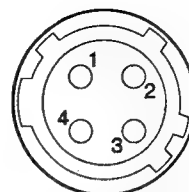
DC IN (4P, MALE)



(External view)

Pin No.	Signal	Specification
1	EXT DC IN (G)	GND
2	—	—
3	—	—
4	EXT DC IN (X)	+11 to +17 Vdc

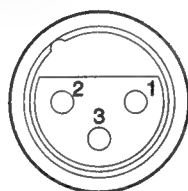
DC OUT (4P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	EXT DC OUT (G)	GND
2	—	—
3	—	—
4	EXT DC OUT (X)	+11 to +17 Vdc

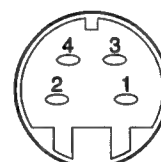
CH-1/CH-2 AUDIO IN (+48 V) (3P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	MIC IN (G)	GND
2	MIC IN (X)	−60 dBu $Z_i \geq 3 \text{ k}\Omega$ /+4 dBu, 10 k Ω
3	MIC IN (Y)	BALANCED

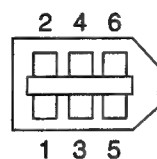
S-VIDEO (4P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	Y (G)	Y: 1.0 Vp-p, 75 Ω , sync negative
2	C (G)	C: For DSR-500WS 0.286 Vp-p (burst level), 75 Ω
3	Y (X)	For DSR-500WSP 0.3 Vp-p (burst level), 75 Ω
4	C (X)	

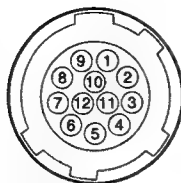
I.LINK (6P)



(external view)

Pin No.	Signal
1	VP
2	VG
3	TPB*
4	TPB
5	TPA*
6	TPA

LENS (12P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	RET SW IN	ON: 0 ± 0.5 Vdc
2	VTR START/STOP IN	TRIG: 0 ± 0.5 V
3	POWER +12 V DC GND	GND for +12 Vdc
4	COMPULSORY AUTO IRIS CONT OUT	AUTO: 4.5 ± 0.5 V MANU: $0 + 0.5$ V or OPEN
5	IRIS CONT OUT	F16: 3.4 Vdc F2.8: 6.2 Vdc
6	POWER +12 V DC OUT	10.6 V to 17.0 Vdc
7	IRIS POSI IN	F16: 3.4 ± 0.1 Vdc F2.8: 6.2 ± 0.1 Vdc
8	REMOTE/LOCAL OUT	REMOTE: 5 V LOCAL: 0 V
9	EXTND ON/OFF IN	
10	ZOOM POSI IN	
11	(SPARE)	
12	(SPARE)	

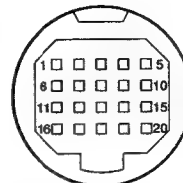
MIC (3P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	MIC (G) IN	GND for MIC
2	MIC (X) IN	-60 dB BALANCED
3	MIC (Y) IN	(0 dB = 0.775 V)

VF (20P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	PEAKING CONT IN	$Z_i \geq 5$ k Ω
2	POWER +12 V DC OUT	10.6 V to 17.0 Vdc
3	REC TALLY IND OUT	$Z_o \leq 500$ Ω
4	BATT IND OUT	$Z_o \leq 1.1$ k Ω
5	ZEBRA SW IN	ON: 0 ± 0.5 V
6	VF VIDEO (X) OUT	$V = 1.0$ Vp-p
7	POWER +12 V DC OUT	10.6 V to 17.0 Vdc
8	(SPARE)	
9	(SPARE)	
10	SDA (VF) OUT	$Z_o \leq 500$ Ω , 5 Vp-p
11	VF VIDEO (G) OUT	GND for VF VIDEO
12	POWER +12 V DC GND	GND for +12 Vdc
13	(SPARE)	
14	(SPARE)	
15	SCL (VF) OUT	$Z_o \leq 500$ Ω , 5 Vp-p
16	R-Y (VF) OUT	$V = 830$ mV
17	POWER +12 V DC GND	GND for +12 Vdc
18	B-Y (VF) OUT	$V = 830$ mV
19	SYNC (VF) OUT	$V = 5$ Vp-p
20	LD (VF) OUT	$Z_o \leq 500$ Ω , 5 Vp-p

REMOTE (10P, FEMALE)



(External view)

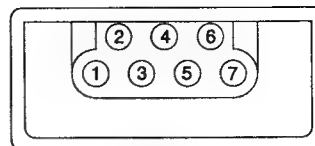
- When connecting the RM-M7G or RCP-TX7

Pin No.	Signal	Specification
1	VJ CONNECT	5.0 V
2	VBS (RM) (OUT)	1.0 V _{p-p} , SYNC NEGATIVE
3	VBS (RM) (OUT)	
4	RS232C (C/RM) IN	
5	VTR START/STOP IN	Z _i ≥ 10 kΩ <div style="display: flex; align-items: center;"> <div style="width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div> OPEN (4.5 ± 0.5 V) 0 ± 0.5 V </div> </div>
6	S.DATA (X)	0 to 5 V Z _i ≥ 10 kΩ
7	RS232C (RM/C) OUT	GND for S.DATA
8	REC TALLY IND OUT	Z _o ≥ 600 Ω
9	POWER +12 V DC GND	GND for +12 Vdc
10	POWER +12 V DC OUT	10.6 V to 17.0 Vdc

- When connecting the RM-VJ1

Pin No.	Signal	Specification
1	VJ-CONNECT	5.0 V
2	VBS (RM) OUT	1.0 V _{p-p} , SYNC NEGATIVE
3	VBS (RM) OUT	
4	AUDIO (Y) IN	
5	AUDIO (X) IN	-30 dB BALANCED
6	RS232C (C/RM) IN	
7	RS232C (RM/C) OUT	
8	REC TALLY IND OUT	Z _o ≥ 60 Ω
9	POWER +12 V DC GND	GND for +12 Vdc
10	POWER +12 V DC OUT	10.6 V to 17.0 Vdc

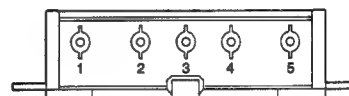
WRR (7P, FEMALE)



(External view)

Pin No.	Signal	Specification
1	WIRELESS GND	
2	AF OUTPUT (X)	-40 dBu BALANCED Z _i ≥ 3 kΩ
3	AF OUTPUT (Y)	
4	(SPARE)	
5	(SPARE)	
6	(SPARE)	
7	POWER +12 V DC OUT	10.6 V to 17.0 Vdc

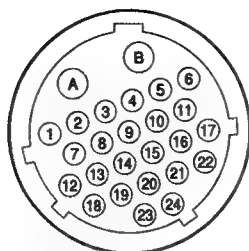
BATTERY (5P, MALE)



(External view)


Pin No.	Signal	Specification
1	BATTERY	GND
2	BATTERY CONT	Z _o ≤ 500 Ω
3	BATTERY REMAIN	Z _o ≤ 500 Ω
4	BATTERY ID	Z _i ≥ 10 kΩ
5	BATTERY (+)	+12 V DC IN 10.6 V to 17.0 V

EXT VTR (26P, MALE)



(External view)

Pin No.	Signal	Specification
A	EXT DC (CCZ) IN (X)	Sensing for power save circuit (ES-26/26P)
B	EXT DC IN (G)	—
*1	EN/Y VIDEO OUT (X)	VBS/Y = 1.0 Vp-p ± 1 dB (100 %) Zo = 75 Ω ± 5 % DC = 0 ± 100 mV
*2	EN/CF/CHROMA (G)	GND for ADP VIDEO
*3	Y OUT (G)	GND for Y
*4	Y OUT (X)	VS = 1.0 Vp-p ± 0.5 dB (100 %) Zo = 75 Ω ± 5 % DC = 0 ± 200 mV
*5	R-Y OUT (X)	VS = 756 mVp-p ± 2 % [for DSR-500WS] 525 mVp-p ± 2 % [for DSR-500WSP] (75 % COLOR BARS) Zo = 75 Ω ± 5 % DC = 0 ± 200 mV
*6	R-Y OUT (G)	GND for R-Y
*7	B-Y OUT (X)	VS = 756 mVp-p ± 2 % [for DSR-500WS] 525 mVp-p ± 2 % [for DSR-500WSP] (75 % COLOR BARS) Zo = 75 Ω ± 5 % DC = 0 ± 200 mV
*8	B-Y OUT (G)	GND for B-Y
9	MIC OUT (X)	-60 dBm/-20 dBm Zo ≤ 600 Ω
10	MIC OUT (Y)	BALANCED
11	MIC OUT (G)	GND for MIC
12	VTR START/STOP OUT TALLY OUT	START: 4.5 ± 0.5 V STOP: 0 ± 0.5 V Zo ≤ 10 k Ω
13	BATT IND IN	Zi ≥ 300 Ω (Note 1)
14	(SPARE)	—
15	REC ALARM IN	Zi = 20 k Ω (Note 2)
16	(SPARE)	—
17	AUDIO MONITOR IN (G)	GND for AUDIO MONITOR
18	RET/PB VIDEO IN (X)	Zi = 75 Ω ± 5 % VS = 1.0 Vp-p ± 1 % (100 %) DC = 0 ± 200 mV

Pin No.	Signal	Specification
19	RET/PB VIDEO IN (G)	GND for PB VIDEO
20	AUDIO MONITOR IN (X)	Zi = 750 Ω (1 kHz) SAVE: 4.5 ± 0.5 V STANDBY: 9.0 ± 1.0 V -0.5 V Zo ≥ 10 k Ω
21	(SPARE)	—
*22	CF/CHROMA OUT (X)	CF:  5.0 ± 1.0 Vp-p Zo = 1 k Ω ± 5 % DC = 0 ± 200 mV CHROMA: 286 mVp-p [for DSR-500WS] 300 mVp-p [for DSR-500WSP] Zo = 75 Ω DC = 0 ± 200 mV
23	(SPARE)	—
24	(SPARE)	—

* Selection with EXT VTR output switch

	COMPONENT VBS	Y/C
1	EN VIDEO OUT (X)	Y OUT (X)
2	EN VIDEO/CF OUT (G)	Y/CHROMA OUT (G)
3	Y OUT (G)	—
4	Y OUT (X)	—
5	R-Y OUT (X)	—
6	R-Y OUT (G)	—
7	B-Y OUT (X)	—
8	B-Y OUT (G)	—
22	CF OUT (X)	CHROMA OUT (X)

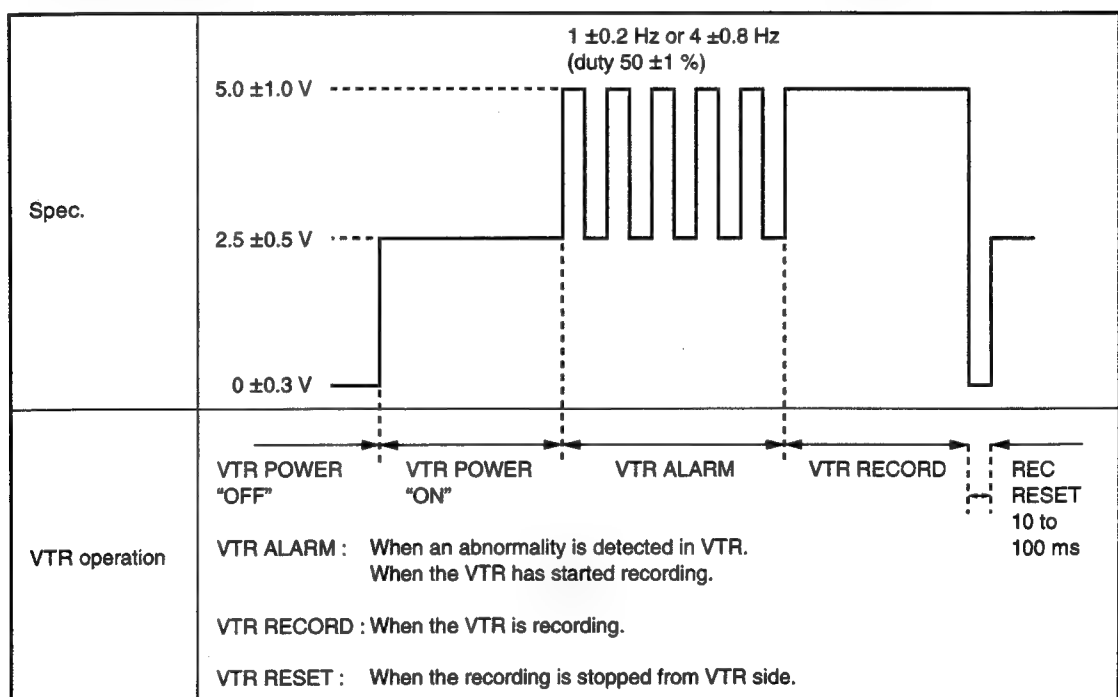
Note 1: 13 pin (BATT IND IN)

The EXT VTR connected to the EXT VTR connector (CCZ 26pin) has a battery voltage detection circuit and warning signal output circuit. The circuit informs the camera of the battery voltage drop by sending the following signal to pin 13. The camera uses the LED on the viewfinder to warn the user the condition.

VTR battery voltage	More than 11.1 Vdc	10.8 to 11.1 Vdc	Less than 10.8 Vdc
Spec.	$2.5 \pm 0.5 \text{ V}$ ----- $0 \pm 0.5 \text{ V}$ -----	$1 \pm 0.2 \text{ Hz}$ or $4 \pm 0.8 \text{ Hz}$ (duty $50 \pm 1 \%$)	
LED in viewfinder	Goes out	Blinks	Lights

Note 2: Pin 15 (REC ALARM IN)

This signal indicates the operating status of VTR. The specifications of the signal is shown below.



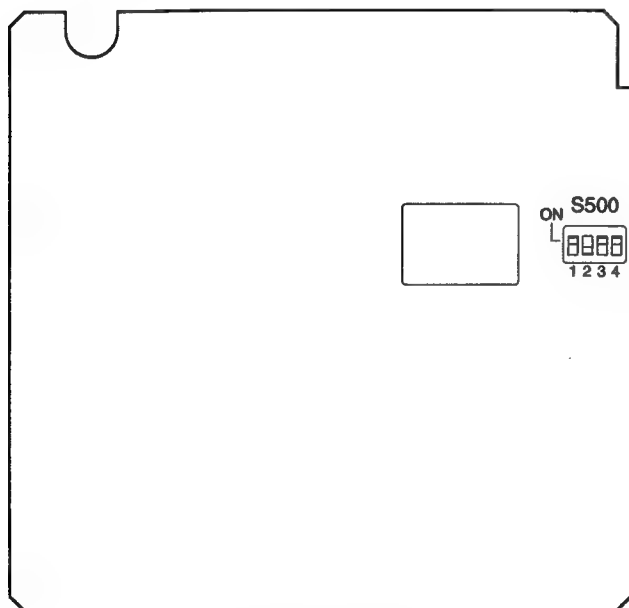
3-13. BOARD SWITCH AND SLIT SETTINGS

3-13-1. SV-213 Board

• **S500**

Settings at shipment: ☐

1. DESTINATION setting
☐ ON: NTSC
 OFF: PAL
2. DESTINATION setting (Effective when pin 1 is on.)
 ON: UC
☐ OFF: J
3. DEBUGGING mode setting (for designer)
☐ ON: At shipment and all times
4. SLACK DETECTION ON/OFF switching
☐ ON: SLACK mute off
 OFF: SLACK mute on



SV-213 board (A side)

3-13-2. ES-26/26P Board

S401 (POWER SAVE)

When S401 is set to "NORM" and no external VTR is connected, current consumption of the unit can be reduced.

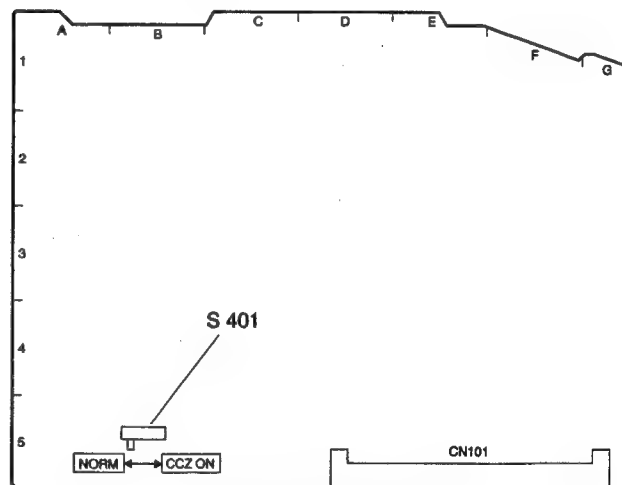
NORM: current consumption reduction

The power supply circuit (Q419) on the ES-26/26P board is turned ON when the external VTR has been connected to the EXT VTR connector (pin 26) on the rear panel and the power of the external VTR is turned ON. As a result, various signals are output from pins 93 to 100 of the ES-26/26P board.

Usually, S401 is set to "NORM" position at the factory.

CCZ ON : current consumption no-reduction

Regardless of the EXT VTR connector's connection, the power supply circuit (Q419) on the ES-26/26P board is always ON, and the various signals are output from pins 93 to 100 of the ES-26/26P board.



ES-26/26P board (A side)

3-14. CHANGING THE BATTERY BEFORE END/BATTERY END AND BP BATTERY PRESET VOLTAGE

3-14-1. Changing the Voltage (1)

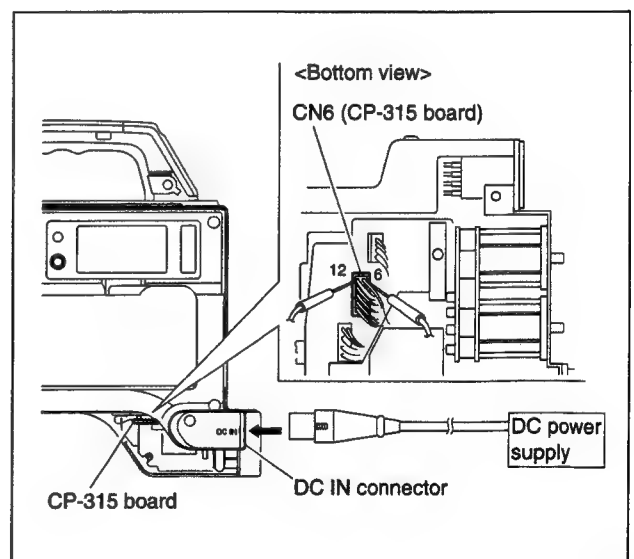
The battery before end/battery end and BP battery preset voltage can be changed as follows with an external DC power supply from the SYSTEM MENU.

- Settable range: 11.0 to 12.5 V (Battery before end/
battery end)
12.0 to 15.9 V (BP battery preset)
- Settable unit: 0.1 V
- Settings at shipment: Battery before end voltage: 11.27 V
Battery end voltage: 10.95 V
BP battery preset voltage: 12.97 V
- Equipment required: DC power supply, Digital voltmeter,
DVCAM cassette tape
- Switch settings: LIGHT, BACK TALLY = OFF
CAMERA = COLOR BAR

Setting

1. Remove the bottom panel. (Refer to Section 3-2-3.)
2. Connect the DC power supply to DC IN connector.
3. Insert a cassette tape, and set the unit into the REC mode.

- Note:**
- Touch the lead tip of the digital voltmeter to pin 6 (GND) and pin 12 (DC power) of connector CN6 on the CP-315 board as shown in Fig. 1, and adjust the DC power supply to the desired voltage.
 - Be careful not to touch the lead tip of the digital voltmeter to the chassis and other connector pins.

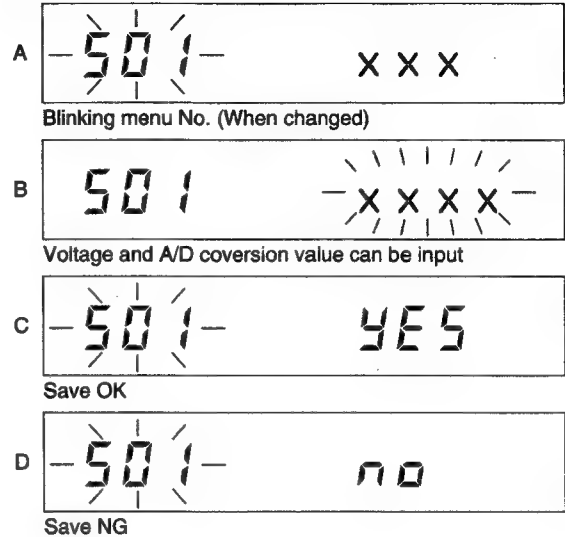


Setting the Battery Before End

1. Set the SYSTEM MENU (refer to Section 5-1-2), and select the "Battery before end setting mode (Menu No. 501)." (Refer to Fig. A.)
2. Press the RESET (MENU SET) button to blink the voltage displayed on the display window (Fig. B). Input the desired voltage measured with the digital voltmeter into the DC IN connector. (Fig. 1)
3. Press the RESET (MENU SET) button. (The value set will be written in the EEPROM) and "YES" will be displayed when the desired voltage is set (Fig. C). "no" will be displayed when an error occurs while writing in the EEPROM and the value could not be set (Fig. D). In this case, repeat steps 1 to 3.

Note: The voltage value shown on the display window is for reference only.

Display window (LCD)



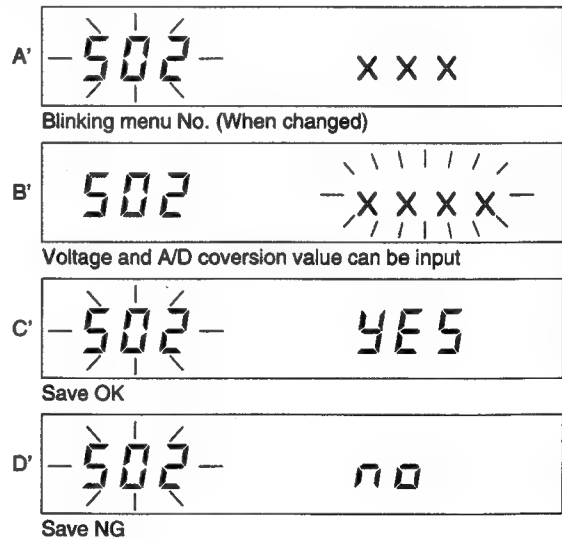
Setting the Battery End

1. Set the SYSTEM MENU (refer to Section 5-1-2), and select the "Battery end setting mode (Menu No. 502)." (Refer to Fig. A'.)
2. Press the RESET (MENU SET) button to blink the voltage displayed on the display window (Fig. B'). Input the desired voltage measured with the digital voltmeter into the DC IN connector. (Fig. 1.)
3. Press the RESET (MENU SET) button to write the set value in the EEPROM. "YES" will be displayed when the desired voltage is set (Fig. C'). "no" will be displayed when an error occurs while writing in the EEPROM and the value could not be set (Fig. D'). In this case, repeat steps 1 to 3.

Note:

- VTR operations stop according to the battery end voltage set. Set the voltage as 10.95 ± 0.01 V.
- The voltage value shown on the display window is for reference.
- If this menu is set by mistake, always press the MENU button to exit from this menu. Never press the RESET (MENU SET) button. When pressing the RESET (MENU SET) button, the data being set will be written.

Display window (LCD)



Setting the BP Battery Preset

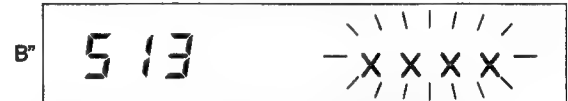
1. Set the SYSTEM MENU (refer to Section 5-1-2), and select the "BP battery preset mode (Menu No. 513)." (Refer to Fig. A")
2. Press the RESET (MENU SET) button to blink the voltage displayed on the display window (Fig. B"). Input the desired voltage measured with the digital voltmeter into the DC IN connector. (Fig. 1.)
3. Press the RESET (MENU SET) button to write the set value in the EEPROM. "YES" will be displayed when the desired voltage is set (Fig. C"). "no" will be displayed when an error occurs while writing in the EEPROM and the value could not be set (Fig. D"). In this case, repeat steps 1 to 3.

- Note:**
- Set the voltage as 12.97 ± 0.01 V.
 - The voltage value shown on the display window is for reference.
 - If this menu is set by mistake, always press the MENU button to exit from this menu. Never press the RESET (MENU SET) button. When pressing the RESET button, the data being set will be written.

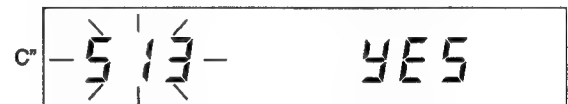
Display window (LCD)



Blinking menu No. (When changed)



Voltage and A/D conversion value can be input



Save OK



Save NG

3-14-2. Changing the Voltage (2)

The battery before end/battery end and BP battery preset voltage can be changed according to the following procedure from the SYSTEM menu without the equipment listed in the previous Section 3-14-1. However, the voltage can be changed more accurately using the procedure described in the previous Section, it is recommended that the voltage be changed using that procedure.

Settable range: 11.0 to 12.5 V (Battery before end/
battery end)

12.0 to 15.9 V (BP battery preset)

Setting at shipment: Battery before end voltage: 11.27 V

Battery end voltage: 10.95 V

BP battery preset voltage: 12.97 V

Standard values at shipment:

<Battery before end/battery end>

Voltage (V)	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	12.0
Standard value	96	9A	9E	A2	A8	Ae	b4	b9	be	c3	38

<BP battery preset>

Voltage (V)	12.5	12.6	12.7	12.8	12.9	13.0	13.1	13.2	13.3	13.4	13.5
Standard value	55	57	60	64	68	6c	72	79	7e	83	89

* The standard value may differ according to the unit.

The above values are average values.

Switch setting: BACK TALLY = OFF

Setting

1. Turn on the power.

Setting the Battery Before End

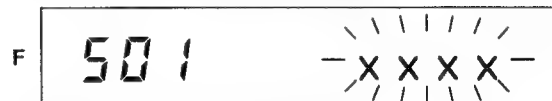
1. Set the SYSTEM MENU (refer to Section 5-1-2), and select the "Battery before end setting mode (Menu No. 501)." (Refer to Fig. E.)
2. Press the RESET (MENU SET) button to blink the voltage on the display window (Fig. F).
3. Press the SHIFT button while pressing the ADVANCE button.
4. Note down the voltage on the display window.
5. Change the value by pressing the ADVANCE button, and move to the next digit with the SHIFT button (Fig. G).
For your reference, the voltage increases by about 0.02 V when the right digit value is increased by one step.
6. Press the RESET (MENU SET) button to write the set value in the EEPROM. "YES" will be displayed when the desired voltage is set (Fig. H). "no" will be displayed when an error occurs while writing in the EEPROM and the value could not be set (Fig. I). In this case, repeat steps 1 to 6.

- Note:**
- The voltage value shown on the display window is for reference only.
 - If the value in step 4 was not taken down, change the value using the values at shipment on the previous page as reference.
 - If this menu is set by mistake, always press the MENU button to exit from this menu. Never press the RESET (MENU SET) button. When pressing the RESET button, the data being set will be written.

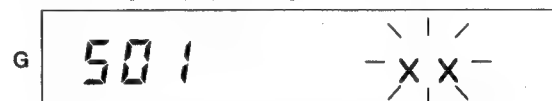
Display window (LCD)



Blinking menu No. (When changed)



The voltage display blinking



A/D conversion value blinking display



Save OK



Save NG

Setting the Battery End

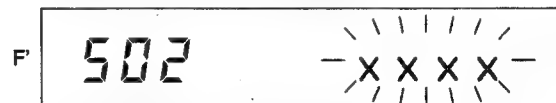
1. Set the SYSTEM MENU (refer to Section 5-1-2), and select the "Battery end setting mode (Menu No. 502)." (Refer to Fig. E').
2. Press the RESET (MENU SET) button to blink the voltage on the display window (Fig. F').
3. Press the SHIFT button while pressing the ADVANCE button.
4. Note down the voltage on the display window.
5. Change the value by pressing the ADVANCE button, and move to the next digit with the SHIFT button (Fig. G').
For your reference, the voltage increases by about 0.02 V when the right digit value is increased by one step.
6. Press the RESET (MENU SET) button to write the set value in the EEPROM. "YES" will be displayed when the desired voltage is set (Fig. H'). "no" will be displayed when an error occurs while writing in the EEPROM and the value could not be set (Fig. I'). In this case, repeat steps 1 to 6.

- Note:**
- VTR operations stop according to the battery end voltage set. Set the voltage as 10.95 ± 0.01 V.
 - The voltage value shown on the display window is for reference.
 - If this menu is set by mistake, always press the MENU button to exit from this menu. Never press the RESET (MENU SET) button. When pressing the RESET button, the data being set will be written.
 - If the value at step 4 was not taken down, change the value using the values at shipment on the previous page as reference.

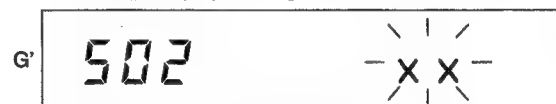
Display window (LCD)



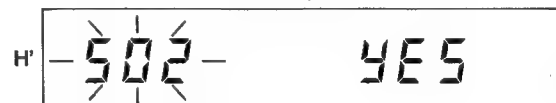
Blinking menu No. (When changed)



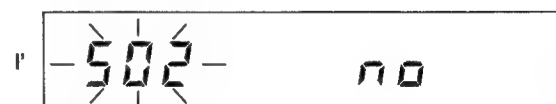
The voltage display blinking



A/D conversion value blinking display



Save OK



Save NG

Setting the BP Battery Preset

1. Set The SYSTEM MENU (refer to Section 5-1-2), and select the "BP battery preset mode (Menu No. 513)." (Refer to Fig. E")
2. Press the RESET (MENU SET) button to blink the voltage on the display window (Fig. F").
3. Press the SHIFT button while pressing the ADVANCE button.
4. Note down the voltage on the display window.
5. Change the value by pressing the ADVANCE button, and move to the next digit with the SHIFT button (Fig. G").
6. Press the RESET (MENU SET) button to write the set value in the EEPROM. "YES" will be displayed when the desired voltage is set (Fig. H"). "no" will be displayed when an error occurs while writing in the EEPROM and the value could not be set (Fig. I"). In this case, repeat steps 1 to 6.

- Note:**
- Set the voltage as 12.97 ± 0.01 V.
 - The voltage value shown on the display window is for reference.
 - If this menu is set by mistake, always press the MENU button to exit from this menu. Never press the RESET (MENU SET) button. When pressing the RESET button, the data being set will be written.
 - If the value at step 4 was not taken down, change the value using the values at shipment on the previous page as reference.

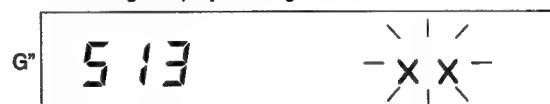
Display window (LCD)



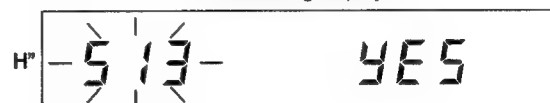
Blinking menu No. (When changed)



The voltage display blinking



A/D conversion value blinking display



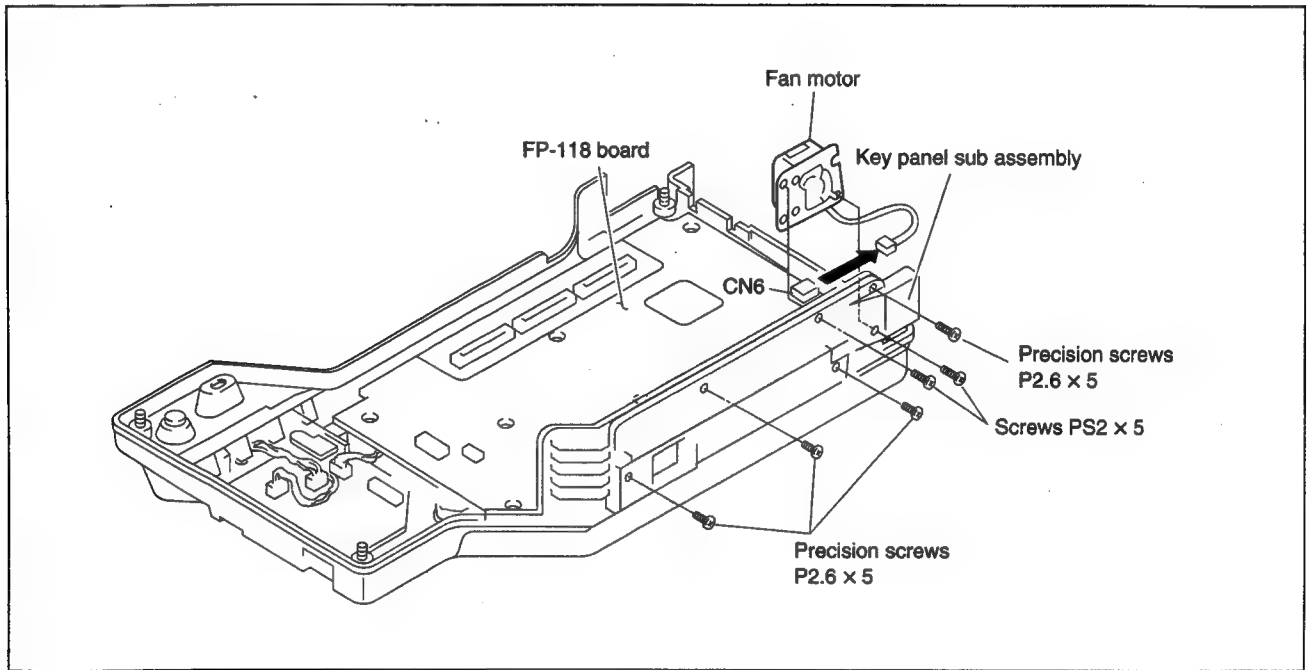
Save OK



Save NG

3-15. REPLACING THE FAN MOTOR

1. Remove the right panel. (Refer to Section 3-2-2.)
2. Remove the four precision screws (P2.6 × 5), then the key panel sub assembly.
3. Disconnect the connector CN6 on the FP-118 board.
4. Remove the two screws (PS2 × 6), then remove the fan motor.



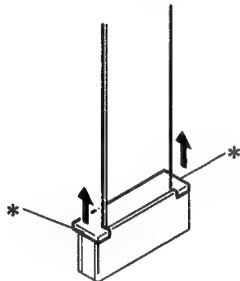
3-16. REPLACING THE FLAT CABLES, FLEXIBLE CARD WIRES/BOARDS

- Replace the flat cables, flexible card wires and boards as follows:
Three types of connectors are also used.
- In order to keep the flexible card wire and board longer life, be very careful not to bent them when handling because they are remarkably sensitive.

Vertical Type Connector

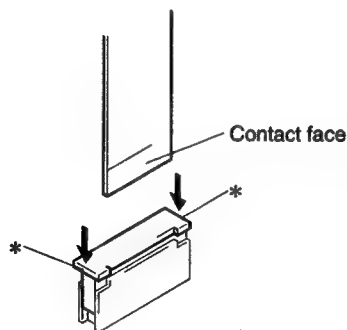
- **Disconnecting**

Slide the * marked section in the arrow direction, release the lock, and disconnect the flexible card wire.



- **Connecting**

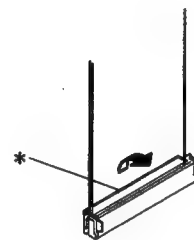
Lift up the * marked sections, and insert the flexible card wire in the connector while paying attention to the contacting surface of the flexible card wire. After fully inserting until it goes, push down the *marked sections to lock the flexible card wire.



Note: When lifting up and down the * marked sections, be sure to hold both ends of connector.

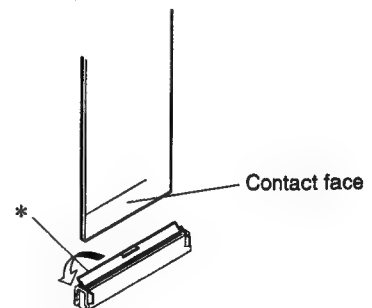
- **Disconnecting**

Open the * marked section in the arrow direction, release the lock, and disconnect the flexible card wire.



- **Connecting**

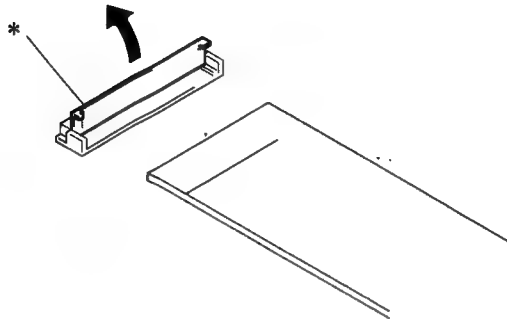
Lift up the * marked section, and insert the flexible card wire in the connector while paying attention to the contacting surface of the flexible card wire. After fully inserting until it goes, push down the * marked section to lock the flexible card wire.



Horizontal Type Connector

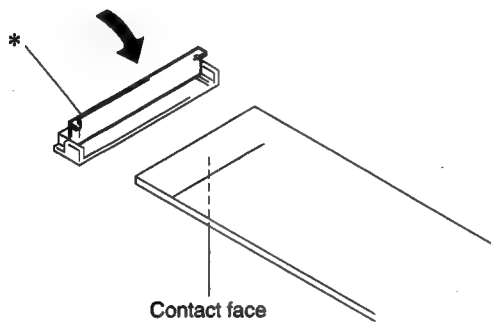
- **Disconnecting**

Open the * marked section in the arrow direction, release the lock, and disconnect the flexible card wire.



- **Connecting**

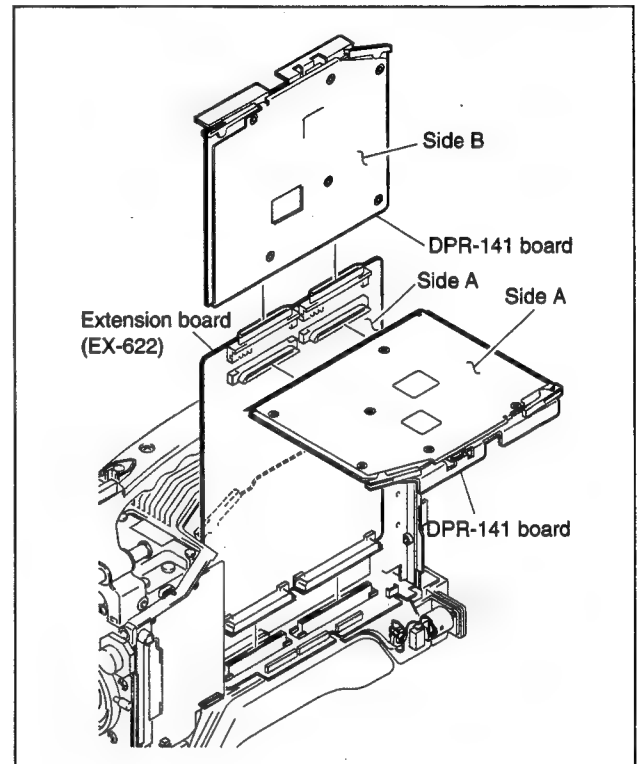
Lift up the * marked section, and insert the flexible card wire in the connector while paying attention to the contacting surface of the flexible card wire. After fully inserting until it goes, close the * marked section to lock the flexible card wire.



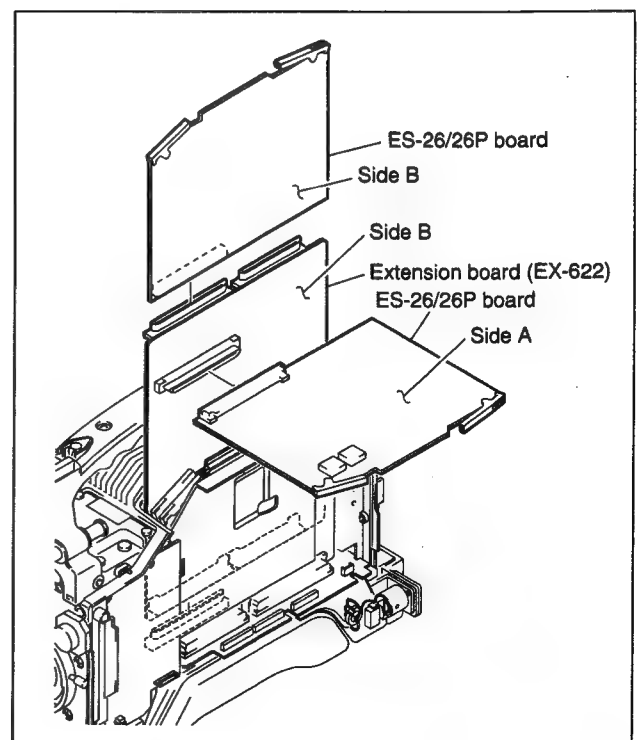
3-17. SERVICE TOOLS AND TEST FIXTURES

3-17-1. Attaching the Extension Board EX-622

- In case of the DPR-141 board.

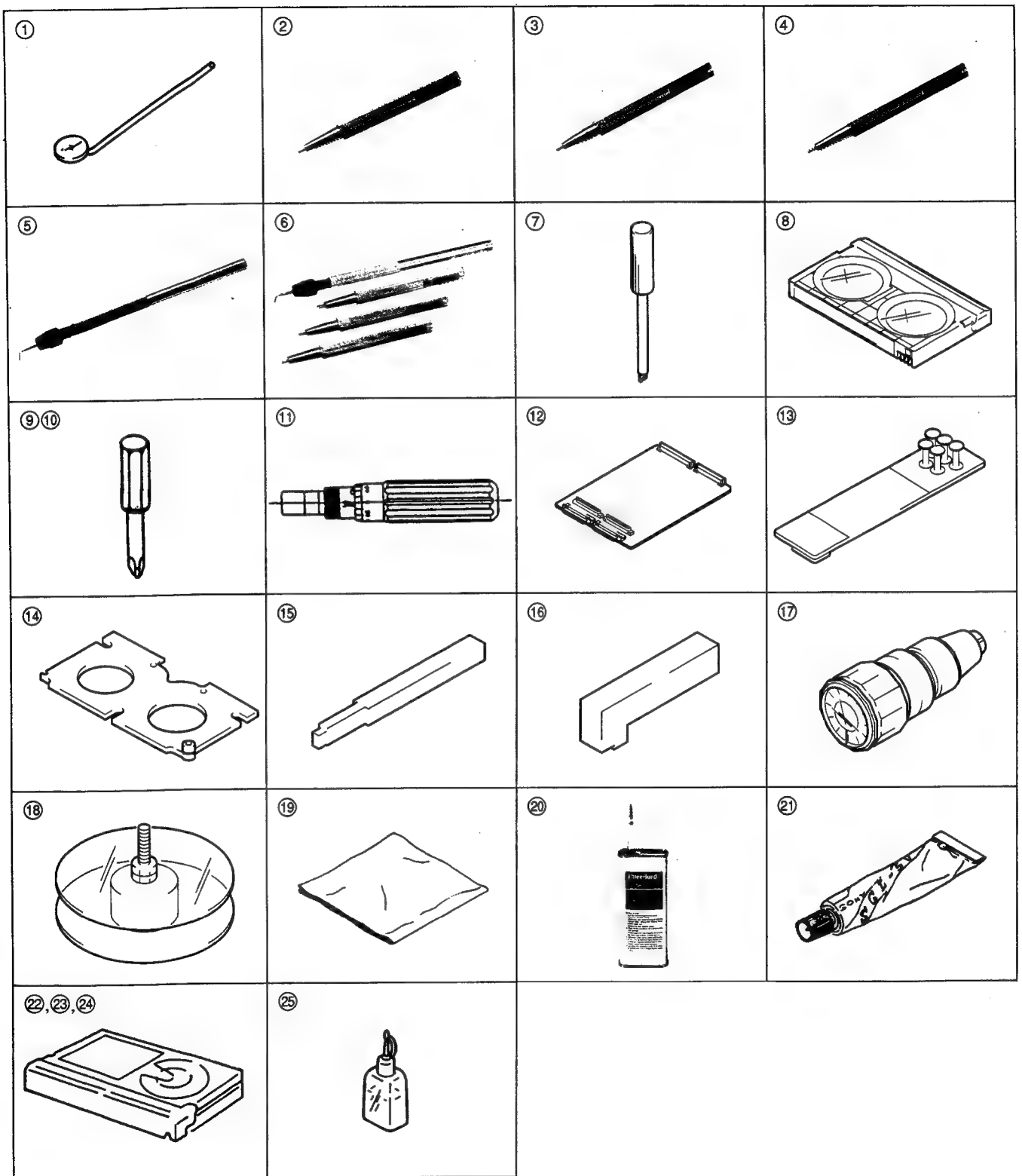


- In case of the ES-26/26P board.



3-17-2. Service Tools and Test Fixtures

Fig No.	Part No.	Name	Usage
1	J-6080-029-A	Small adjustment mirror	Video tracking adjustment
2	J-6082-231-A	Washer attaching tool (For 1.5)	Parts replacement
3	J-6082-232-A	Washer attaching tool (For 1.2)	Parts replacement
4	J-6082-233-A	Washer attaching tool (For 0.8)	Parts replacement
5	J-6082-234-A	Washer removing tool A	Parts replacement
6	J-6082-236-A	Washer attaching/removing kit	Parts replacement (Set of No. 2 to No. 5)
7	J-6082-362-A	Tape guide adjusting screwdriver	Tape guide height adjustment
8	J-6082-373-A	Torque cassette	FWD/REV rewinding torque adjustment, FWD back tension adjustment
9	J-6325-110-A	Torque screwdriver bit (For M1.4)	Parts replacement
10	J-6325-380-A	Torque screwdriver bit (For M2)	Parts replacement
11	J-6325-400-A	Torque screwdriver (3 kg)	Tightening screw
12	J-6276-320-A	Extension board, EX-622	ES-26/26P and DPR-141 boards adjustment
13	J-6442-350-A	RF extension board	RF system adjustment, tape path system adjustment
14	J-6442-410-A	Reference plate	Reel table height adjustment, tape guide height adjustment reference plate
15	J-6442-420-A	Guide gauge	Tape guide height adjustment
16	J-6442-430-A	Reel table height check gauge	Reel table height adjustment
17	J-6442-510-A	Torque gauge (90ATG)	FWD/REV rewinding torque adjustment
18	J-6442-520-A	Rewinding torque measuring attachment	FWD/REV rewinding torque adjustment
19	3-184-527-01	Cleaning cloth	Cleaning
20	7-432-114-11	Three bond 1401B	Screw-locking compound
21	7-651-000-10	Grease SGL-601 (50 g)	Parts replacement
22	8-967-999-02	Alignment tape XH2-1AST	Tape path system adjustment
23	8-967-999-21	Alignment tape XH5-1A	Video system adjustment (for DSR-500WS)
24	8-967-999-25	Alignment tape XH5-1AP	Video system adjustment (for DSR-500WSP)
25	9-919-573-01	Cleaning liquid	Cleaning



3-18. NOTES ON REPAIR PARTS

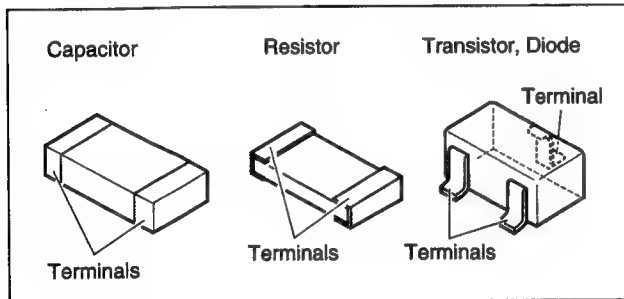
3-18-1. Replacement Procedure of Chip Parts

Tools Required

- Soldering iron: 20 W. If possible, use a soldering iron tip heat-controller set to 270 ± 10 °C.
- Braided wire: Solder Taul or equivalent
Sony Part No. 7-641-300-81
- Solder: 0.6 mm diameter is recommended.
- Tweezers

Soldering Conditions

- Soldering iron temperature: 270 ± 10 °C
- Soldering time: Less than 2 seconds per pin



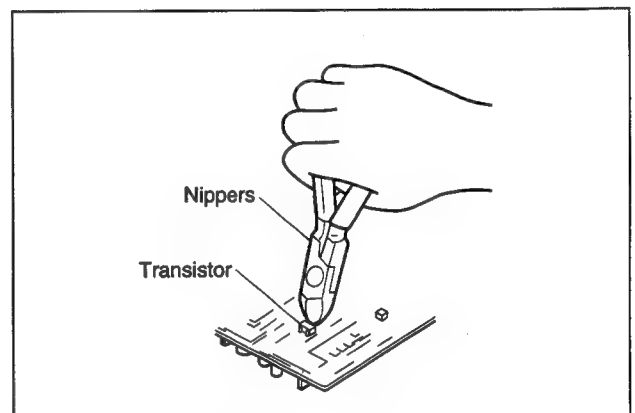
Replacement of Resistor and Capacitor

1. Place the soldering-iron tip onto the chip part and heat it up until the solder is melted. When the solder is melted, slide the chip part aside.
2. Make sure that there is no pattern peeling, damage and/or bridge around the desoldering positions.
3. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
4. Place the new chip part at the desired position and solder both ends.

Note: Do not use chips parts that have been removed once.

Replacement of Transistors and Diodes

1. Cut the terminals of the chip part with nippers.
2. Remove the cut leads with soldering iron.
3. Make sure that there is no pattern peeling, damage and/or bridge around the desoldering positions.
4. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
5. Place the new chip part at the desired position and solder the terminals.



Replacement of ICs

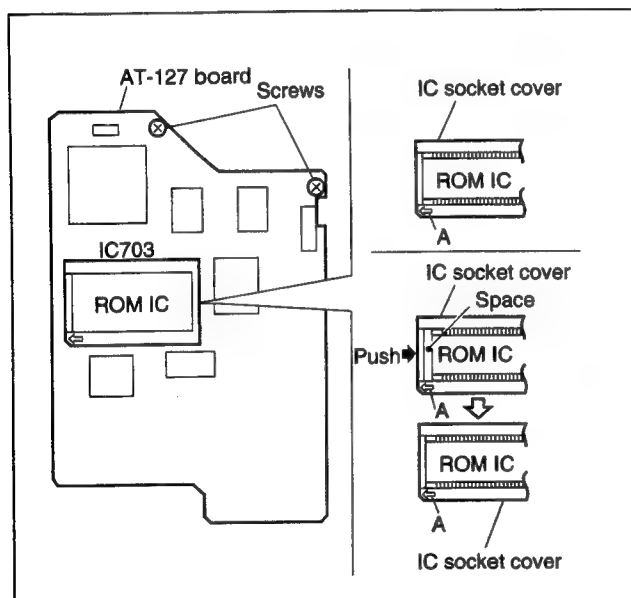
1. Using the braided wire, remove the solder around the pins of the IC-chip to be removed.
2. While heating up the pins, remove the pins one by one using tweezers and equivalent.
3. Make sure that there is no pattern peeling, damage and/or bridge around the desoldering parts.
4. After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
5. Place the new chip part at the desired position and solder the terminals.

3-18-2. Note on Replacing the ROM

1. Replacing the ROM (IC703/AT-127 Board)

Note: When replacing the ROM, remove the two screws, open the AT-127 board, and remove the IC socket cover while pushing the back side of ROM.

- ① Remove the IC socket cover by pushing it in the arrow direction until clicking.
- ② Replace the former ROM by a new one.
- ③ Put the IC socket cover while keeping some space at the arrow A side.
- ④ While pushing the ROM, push the IC socket cover in reverse direction of arrow A until it clicks.



2. Replacing the EEPROM

After replacing the EEPROM, initialize it using the following menu.

EEPROM	MENU No.
SY EEPROM on the DPR-141 board (IC401)	750
SP EEPROM on the DPR-141 board (IC652)	751
EEPROM (IC1) on the HN-227 board	753
EEPROM (IC770) on the RP-91 board	755

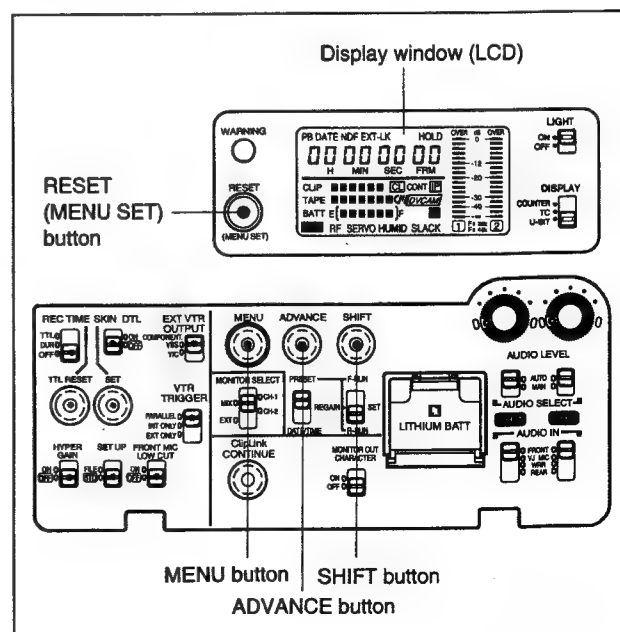
- When the EEPROM (IC1) on the HN-227 board has been replaced or initialized, perform mechanical adjustments in the following procedures (Refer to each Section for details).

- ① 11-2-1. Capstan FG-DUTY Adjustment
- ② 11-2-2. Reel FG-DUTY Adjustment
- ③ 7-38. Reel Table FWD/REV Winding Torque Check Adjustment
- ④ 8-8. Switching Position Adjustment

- When the EEPROM (IC770) on the RP-91 board has been replaced or initialized.

Perform an adjustment in the order of menus No.700, 701, 702, and 704 (Refer to Section 11-3 RF System Alignment for details).

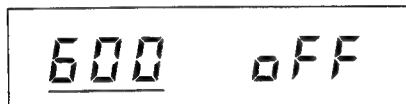
- After replacing the EEPROM on the FP-98 board, it is necessary to perform KY EEPROM ECHO BACK DATA PRESET using Menu No. 752. (For details, refer to 3-28-4.)



3-18-3. Initializing Procedure for EEPROM

1. Set the maintenance menu, and select Menu No. 75X.

- (1) Press the MENU button while pressing the SHIFT button, then release the SHIFT button first, and release the MENU button after pressing more than 1 second. The following message will be displayed on the display window (LCD). (Characters underlined on the display window (LCD) in the following operations hereafter indicate that they are blinking.)



- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.

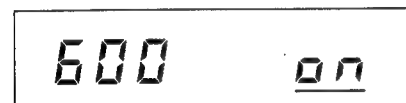
The following message will be displayed on the display window (LCD).



Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on."


The following message will be displayed on the display window (LCD).



Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

- (4) Press the RESET (MENU SET) button once.

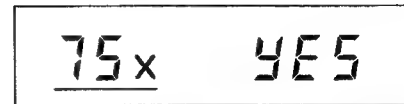
The following message will be displayed on the display window (LCD).



Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several times to display Menu No. 75X.

The following message will be displayed on the display window (LCD).



If the following is displayed, it indicates that the data when the power was turned on the last time cannot be used. Press the MENU button to exit from the maintenance menu, turn off the power supply and replace each EEPROM with those attached to the old boards.



2. Press the RESET (MENU SET) button.

Check that the following message will be displayed on the display window (LCD).

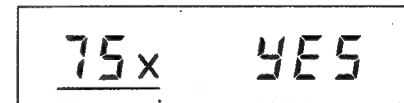


Each time the ADVANCE button is pressed, "Set" and "ESC" will blink alternately.

To cancel, press the RESET (MENU SET) when "ESC" is displayed.

3. Press the RESET (MENU SET) button once.

Check that the following message will be displayed on the display window (LCD).



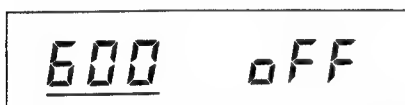
If "no" is displayed on the display window (LCD), exit from Menu No. 75X once, and perform the above procedure again. If the display does not change, check if the peripheral circuits of EEPROM of the each boards are abnormal, and replace with the EEPROM attached to the old board.

4. Press the MENU button to exit from the maintenance menu. The display window (LCD) will return to the state before the maintenance menu was displayed.

3-18-4. KY EEPROM Echo Back Data Preset Procedure

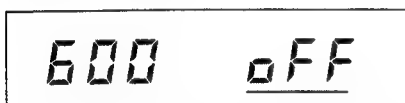
- Note:**
- Because data may be lost when replacing the board and EEPROM, note down following menu No. settings before performing the replacement.
(Menus which should be noted down.)
No. 201, 204, 206, 207, 211 to 214, 220, 308, 401, 402, 405, 406, 501 to 503 and 513
(However, the hours meter cannot be reset.)
For details of the menus, refer to 5-1. Menu.
 - Be sure to preset this data after replacing the FP-118 board and EEPROM (IC204) on the FP-118 board.

1. Set the maintenance menu, and select Menu No. 752.
- (1) Press the MENU button while pressing the SHIFT button, then release the SHIFT button first, and release the MENU button after pressing more than 1 second. The following message will be displayed on the display window (LCD). (Characters underlined on the display window (LCD) in the description of operations hereafter indicate that they are blinking.)



The LCD display shows the number '600' on the left and the word 'OFF' on the right. The 'OFF' is underlined, indicating it is the active or blinking value.

- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.
The following message will be displayed on the display window (LCD).



The LCD display shows the number '600' on the left and the word 'OFF' on the right. The 'OFF' is underlined, indicating it is the active or blinking value.

Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

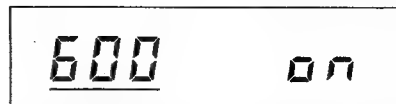
- (3) Press the ADVANCE button once, and select "on."
The following message will be displayed on the display window (LCD).



The LCD display shows the number '600' on the left and the word 'on' on the right. The 'on' is underlined, indicating it is the active or blinking value.

Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

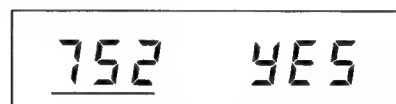
- (4) Press the RESET (MENU SET) button once.
The display window (LCD) will display as follows.



The LCD display shows the number '600' on the left and the word 'on' on the right. The 'on' is underlined, indicating it is the active or blinking value.

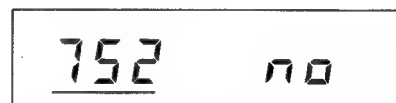
Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several times and display Menu No. 752.
The following message will be displayed on the display window (LCD).



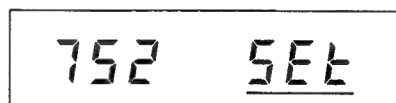
The LCD display shows the number '752' on the left and the word 'YES' on the right. The 'YES' is underlined, indicating it is the active or blinking value.

If the following message will be displayed on the display window (LCD), it indicates that the data the last time the power was turned on cannot be used properly. Therefore, press the MENU button to exit from the maintenance menu, turn OFF the power and replace the EEPROM (IC204) with that attached to the old board. After replacing the EEPROM, perform Section 2-19. "Changing the Battery Before End/Battery End/BP Battery Preset Voltage".



The LCD display shows the number '752' on the left and the word 'no' on the right. The 'no' is underlined, indicating it is the active or blinking value.

2. Press the RESET (MENU SET) button.
Check that the following message will be displayed on the display window (LCD).

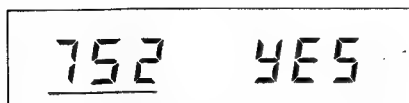


The LCD display shows the number '752' on the left and the word 'SET' on the right. The 'SET' is underlined, indicating it is the active or blinking value.

Each time the ADVANCE button is pressed, "Set" and "ESC" will blink alternately.

This mode can be cancelled by pressing the RESET (MENU SET) button while "ESC" is displayed.

3. Press the RESET (MENU SET) button once.
Check that the following message will be displayed on the display window (LCD).



If "no" is displayed on the display window (LCD), exit from Menu No. 752 once, and perform the above procedure again. If the display does not change, check if the peripheral circuits of EEPROM (IC204) of the FP-118 board are abnormal, and replace with the EEPROM attached to the old board.

4. Press the MENU button to exit from the maintenance menu. The display window (LCD) will return to the state before the maintenance menu was displayed.

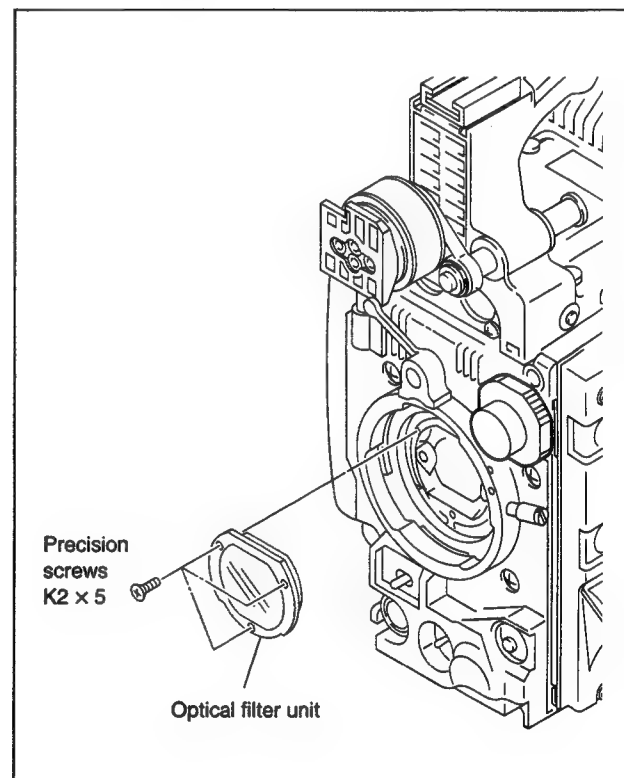
3-19. RECOMMENDED REPLACEMENT PART

Optical filter unit in the unit is a recommended replacement part. It may be turned cloudy with the lapse of time.

If using a cloudy filter, the performance of camera will not be delivered. Replace it according to necessary.

Note : It is recommended to replace the optical filter unit in a clean room.

Part name	Sony Part No.
FILTER UNIT, OPTICAL	1-758-131-11



3-20. I.LINK CONTROL COMMAND

AV / C Command List

The following list shows AV/C command (Only VCR Subunit Command) of which are supported with DSR-500WS/500WSP.

AV/C command conform to 1394 TA Document AV/C Digital Interface Command Set General Specification/VCR Subunit Specification Version 2.0.1 Jan.5,1998.

AV/C command has the following three types.

- CONTROL Command : Control command
- STATUS Inquiry Command : Sense command
- SPECIFIC Inquiry Command : Inquiry command whether control command are supported or not.

Opcode	Value	Support		Comments
		C	S	
ABSOLUTE TRACK NUMBER	52h	○	○	Absolute Track Number search / sense command
BINARY GROUP	5Ah		○	Binary Group Data sense command
LOAD MEDIUM	C1h		○	Eject command
MEDIUM INFO	DAh		○	Tape Information sense command
OPEN MIC	60h	○	○	MIC open / close command
OUTPUT SIGNAL MODE	78h	○	○	Output Signal Mode control command
PLAY	C3h		○	Play / Search command
READ MIC	61h		○	MIC Data read command
RECORD	C2h		○	Record command
RECORDING SPEED	DBh	○	○	Recording Speed control command
RELATIVE TIME COUNTER	57h	○	○	COUNTER search / sense / preset command
SEARCH MODE	50h		○	Search Mode sense command
SMPTE / EBU TIME CODE	59h	○	○	Time Code search / sense command
TIME CODE	51h	○	○	Time Code search / sense command
TRANSPORT STATE	D0h		○	Tape transport sense command
WIND	C4h		○	STOP / FF / REW command

* C and S of the Support shows the CONTROL Command and STATUS Command.

SECTION 4

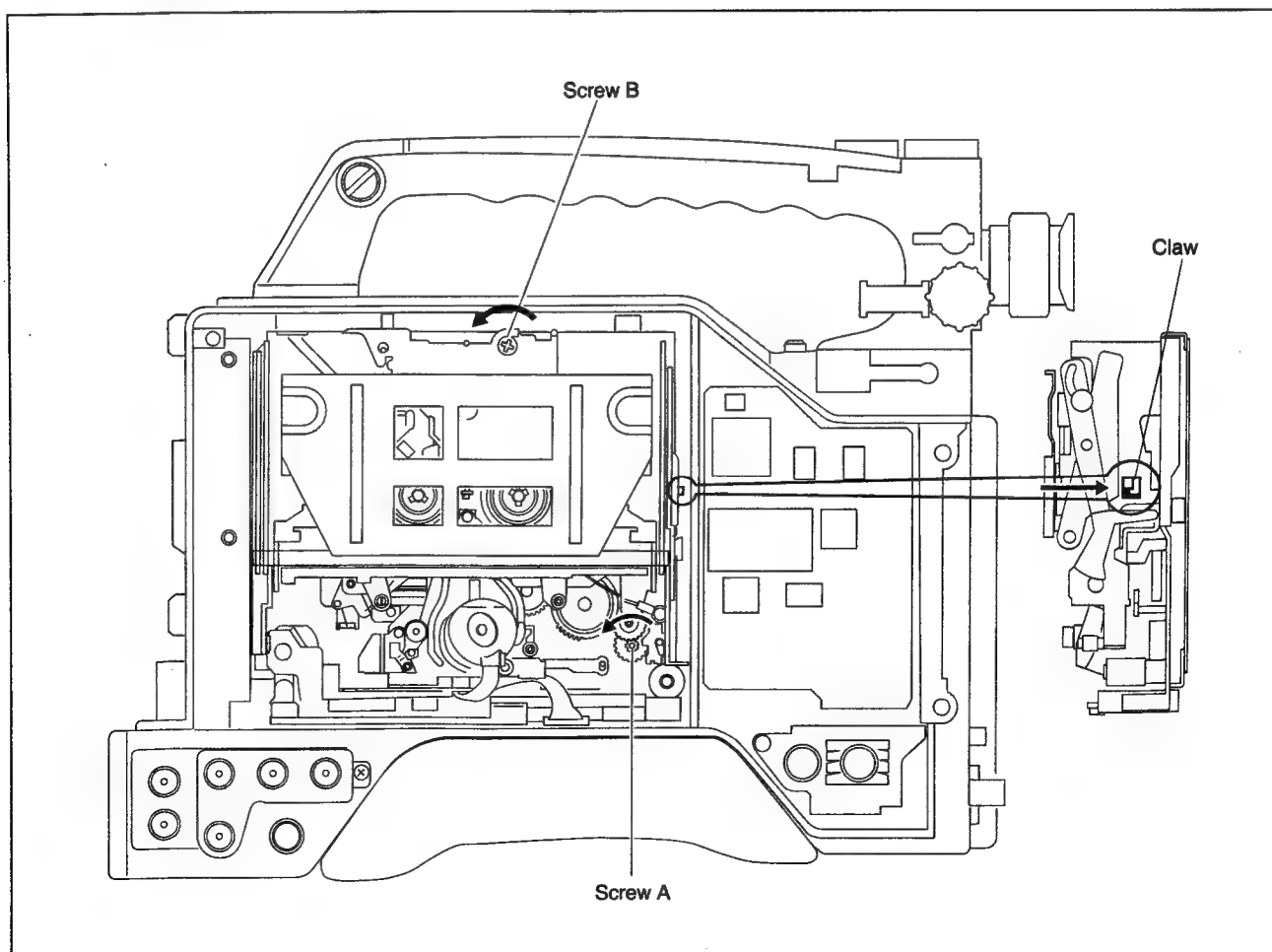
TROUBLESHOOTING

4-1. EXTRACTING THE CASSETTE TAPE WHEN TAPE SLACKS

1. Remove the left panel. (Refer to section 3-2-1.)
2. While holding the cassette compartment so that it does not rise, turn screw A (red) in the counterclockwise direction with a phillips screwdriver until the tape slacks slightly.
3. Turn screw B (red) in a counterclockwise direction with a phillips screwdriver, and wind the tape slacked in step 2.
4. Repeat steps 2 and 3 until the tape has been completely wound.
5. After winding the tape, remove your hand from the cassette compartment, and turn screw A further in a counterclockwise direction so that the cassette compartment rises, then extract the tape. If the cassette compartment does not rise, press the claws on the side of the cassette compartment with a thin screwdriver.

Point to notice when winding the tape:

1. Do not turn the screws A and B strongly.
2. Do not apply excessive tension to the tape.



4-2. CLEANING WHEN HEAD CLOGS

When the video head clogs, clean it as follows:

4-2-1. Using a Cleaning Cassette

1. Load the DVL-12CL cleaning cassette into the unit, play for 5 seconds, and then eject promptly.

Note:

- Be sure to use the DVL-12CL cleaning cassette tape.
Use of other types will cause abnormal wear of the video head or damage to the video head.
- Do not use the rewound cleaning cassette tape.

2. Check that the head clog has been solved. If the head remains clogged even after using the cleaning cassette, clean the video head as follows:

4-2-2. Using the Cleaning Cloth

1. Using a cleaning cloth moistened with cleaning liquid, gently touch the cloth on the video head.
2. Rotate the drum slowly in the rotating direction of the head (towards the left from the top) with your fingers, and clean the video head.

Note:

- Do not move the cleaning cloth over the video head in the vertical direction as this may damage the video head.
- Turn OFF the power when cleaning.

4-3. RELEASING THE HUMID TIMER WHEN CONDENSATION OCCURS

To protect the tape when dew condensation occurs, HUMID ALARM is displayed, and the VTR stops for a specified time set by the HUMID TIMER.

HUMID TIMER is a timer to stop operations for protecting the tape when condensation occurs. It is a function provided for the unit to clear condensation naturally.

When the condensation is cleared manually, the HUMID TIMER will not be turned off even when there is no condensation, and the unit will not operate.

To clear the condensation manually, and to operate the VTR, turn OFF the HUMID TIMER as follows:

1. Set the unit in SYSTEM MENU (Refer to section 5-1-2), and set the HUMID TIMER OFF mode (Menu No. 509).



* X X X indicates the remaining time.

2. Press the RESET button twice, and if X X X becomes 0, it means that the HUMID TIMER has been turned off.

Note: If HUMID TIMER is not released by performing items 1 and 2, condensation is not completely cleared, therefore, clear condensation one more.

4-4. ERROR CODES

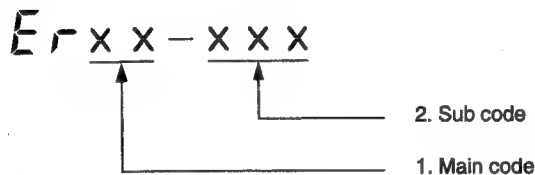
This unit is provided with a function to display error codes when error has been detected. When error has been detected during normal operation, error code is displayed on the LCD screen located in the side of the unit immediately.

- The sensor system's error display (main code 3X) goes off when the error is solved.
- The error display of the communication error between the microcomputer and peripheral devices goes off when the error is solved.
- The reel position motor error display (main mode 21) goes off when the next operation is in normal.
- Other errors remain displayed until the power is turned off.

When an error has been detected, protection operation is carried out according to the mode.

Errors are displayed as an error codes. The contents of the displayed error codes are as follows:

Error Code Display



1. Main Code

The causes of errors can be broadly classified as follows.

- Er0x: Servo system, tape path system error
- Er21: Reel position motor, reel transfer mechanism periphery error
- Er3x: Sensor system error
- Er91: Microcomputer and its periphery device error
- Er92, Er93: Reference signal detection error
- Er95: Communication error between the microcomputer and video or audio signal processing devices.

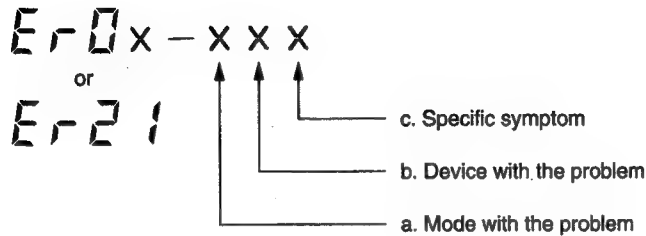
2. Sub Code

For items which require more information than that shown by the main code, the causes of errors are provided in more detail using sub codes.

If information is sufficient with the main code, sub code 000 is displayed.

4-4-1. Servo System, Tape Path System, Reel Mechanism, and Sensor System Errors

Error Code Display



- a. Mode with the problem
 - 0: The mode cannot be identified, or there is no need to identify the mode
 - 1: CASSETTE IN
 - 2: THREADING
 - 5: SEARCH, F.FWD/REW
 - 6: PLAY/REC
 - 8: UNTHREADING
- b. Device with the problem
 - 0: The device cannot be identified, or there is no need to identify the device
 - 2: Function cam motor/cam position sensor
 - 3: Drum motor/drum FG
 - 4: Capstan motor/capstan FG
 - 5: S side reel FG
 - 7: T side reel FG
 - 9: Both S/T side reel FGs or reel motor
 - C: Reel position motor/reel position sensor
- c. Specific symptoms
 - 0: There is no need to identify the symptom
 - 1: The operation did not complete within the designated time
 - 2: Detected speed error
 - 3: Detected tape slack
 - 4: Could not detect FG
 - 8: Detected abnormal current

Error Codes (Er02-Er33)

Error code	Details	Error detection method	Operations when errors occur	Test mode for checking/Possible failures
Er02-098	Detected abnormal current of reel motor.	<p>The mechanism control MICRO COM. could not detect S reel FG (SE-297 board/PH1) T reel FG (SE-297 board/PH2) output, or detected abnormal current of the reel motor.</p> <p>*MICRO COM. means the microcomputer.</p>	<p>When errors occur, SHUT OFF operations are performed, and only the EJECT mode is accepted.</p>	<p>Test mode Capstan test mode 610 Reel test mode 611</p> <p>Possible causes</p> <ul style="list-style-type: none"> • The tape is cut or jammed. • The reel torque cannot be adjusted • Faulty operations of the capstan motor or drive circuit (SV-213 board/IC300) • Faulty operations of the pinch roller block. • Faulty operations of the brake • Reel FG system circuit (SV-213 board/IC2, IC3, IC6) problems • Faulty operations of reel brake • Disconnection or faulty connection of flexible board (SE-297 board) • Problems or faulty disconnection of reel motor • Faulty operations of reel table, etc.
Er02-503	Detected tape slack during SEARCH, F.FWD/REW.			
Er02-554	Could not detect the S reel FG output during SEARCH, F.FWD/REW.			
Er02-574	Could not detect the T reel FG output during SEARCH, F.FWD/REW.			
Er02-594	Could not detect the S/T reel FG output during SEARCH, F.FWD/REW.			
Er02-603	Detected tape slack during PLAY/REC.			
Er02-654	Could not detect S reel FG output during PLAY/REC.			
Er02-674	Could not detect T reel FG output during PLAY/REC.			
Er02-694	Could not detect S/T reel FG output during PLAY/REC.			
Er02-874	Could not detect the T reel FG output during unthreading.		When errors occur, SHUT OFF operations are performed. EJECT mode cannot be accepted.	
Er07-042	Detected capstan speed problem.	The mechanism control MICRO COM. could not detect CAPSTAN FG output or detected speed problem.	When errors occur, SHUT OFF operations are performed, and only the EJECT mode is accepted.	<p>Test mode Capstan test mode 610</p> <p>Possible causes</p> <ul style="list-style-type: none"> • Capstan free speed adjustment (capstan FG duty ratio adjustment) problems • Faulty operations of capstan motor or drive circuit (SV-213 board/IC300) • Capstan FG system circuit (SV-213 board/IC301, IC302) problems • Disconnection or faulty connection of flexible board connecting capstan motor
Er08-032	Cannot recover from drum speed problem.	The mechanism control MICRO COM. could not detect drum motor FG output or detected speed problem.	When errors occur, SHUT OFF operations are performed, and only the EJECT mode is accepted.	<p>Test mode Drum test mode 612</p> <p>Possible causes</p> <ul style="list-style-type: none"> • Drum free speed adjustment (drum FG duty ratio adjustment) problems • Faulty operations of drum motor or drive circuit (SV-213 board/IC400) • Drum FG system circuit (SV-213 board/IC401, IC402) problems • Disconnection or faulty connection of flexible board connected to the drum

Error code	Details	Error detection method	Operations when errors occur	Test mode for checking/Possible failures
Er09-021	Pinch roller ON/OFF did not complete within the set time.	The mechanism control MICRO COM. could not obtain an appropriate input signal from the cam position sensor or detected abnormal current of the function cam (LD) motor.	SHUT OFF operations are performed, and only the EJECT mode is accepted.	Test mode Function test cam mode 613 Possible causes <ul style="list-style-type: none"> Faulty operations of the reel brake Faulty operations of the function cam (LD) motor or drive circuit (SV-213 board/IC201) Incorrect gear position of the threading mechanism or function cam Cam mode sensor (SE-295 board/PH1 to PH4) or detection circuit (SV-213 board/Q803, Q804) problems Disconnection, faulty connection of the flexible board (SE-295 board) Disconnection of the harness
Er09-028	Detected abnormal current of the function cam (LD) motor.			
Er09-221	Threading did not complete within the set time.			
Er09-821	Unthreading did not complete within the set time.			
Er21-IC1	Reel position movement did not complete within the set time.	The mechanism control MICRO COM. could not obtain an appropriate input signal from the reel position sensor or detected abnormal current of the reel position motor.	The error is displayed until the cassette is inserted at the next time.	Possible causes <ul style="list-style-type: none"> Faulty operations of the reel position (shift) motor Faulty operations of the reel table movement mechanism Faulty detection of the reel position sensor (SE-297 board/PH3, PH4) or faulty detection circuit (SV-213 board/Q805) Disconnection or faulty connection of the flexible board (SE-297, MT-114)
Er31-000	Tape top could not be released.	The detection signal (detected tape top or tape end after SHORT FF or SHORT REW) was input to the mechanism control MICRO COM. from the tape top sensor or tape end sensor.	When errors occur, the STOP mode is set. Only the PLAY, FF, and EJECT modes are accepted. The error is displayed until it is corrected.	Possible causes <ul style="list-style-type: none"> Faulty tape top sensor (CC-68 board/Q1)/tape end sensor (SE-295 board/Q1) or detection circuit (SV-213 board/IC3) Disconnection or faulty connection of the flexible board (SE-295, MT-114, CC-68)
Er32-000	Tape end could not be released.		When errors occur, the STOP mode is set. Only the REW and EJECT modes are accepted. The error is displayed until it is corrected.	
Er33-000	Reel position sensor detected STANDARD and MINI at the same time.	Both the detections signals from the L reel position sensor and S reel position sensor were input to the mechanism control MICRO COM.	The error is displayed until it is corrected.	Possible causes <ul style="list-style-type: none"> Faulty L reel position sensor (SE-297 board/PH3)/S reel position sensor (SE-297 board/PH4) Disconnection or faulty connection of the flexible board Faulty detection circuit (SV-213 board/Q805)

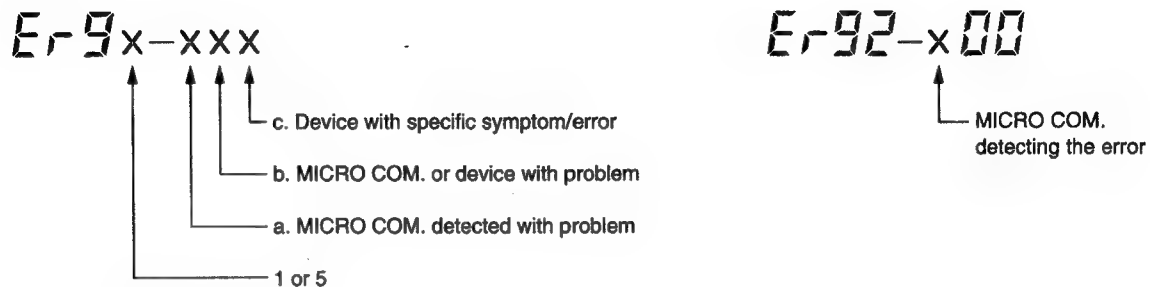
Note 1: For errors of the servo system and tape path system, basic operations can be checked in the test mode.

Note 2: The "Possible failures" above are only for the main problem area.

Note 3: Regarding the test mode, refer to section "5-1. Menu (LCD)."

4-4-2. Communication Error of Microcomputer and Peripheral Devices

Error Code Display



* MICRO COM. means microcomputer.

Note: For Er91 and Er95, the device (EEPROM, IC) or the digital video signal bus from camera with the problem shows the error using sub codes b and c.

- a. MICRO COM. detected with problem
 - 1: System control (SY) MICRO COM. <FP-118 board/IC3>
 - 2: LCD and time code control (KY) MICRO COM. <FP-118 board/IC200>
 - 4: Mechanism control (SV) MICRO COM. <SV-213 board/IC500>
 - 7: Signal processor control (SP) MICRO COM. <DPR-141 board/IC751>
 - F: Index picture control (IP) MICRO COM. <IPM-94 board/IC103>
- b. MICRO COM. or device with problem
 - 1: System control (SY) MICRO COM.
 - 2: LCD and time code control (KY) MICRO COM.
 - 3: EEPROM
 - 4: Mechanism control (SV) MICRO COM.
 - 7: Signal processor control (SP) MICRO COM.
 - 8: Time code IC
 - F: Index picture control (IP) MICRO COM.
- c. Specific Symptom
 - 3: Parity error
 - 5: Communication not possible

Error Codes (Er91-Er95)

Error codes	Contents
Er91-123	Communication (parity) error of data from the LCD/time code control (KY) MICRO COM. to the system control (SY) MICRO COM.
Er91-125	Communication is impossible from the LCD/time code control (KY) MICRO COM. to the system control (SY) MICRO COM. Clock (SCLK) is not input from the LCD/time code control (KY) MICRO COM. A communication is not completed within a specified time.
Er91-131	Error of the EEPROM controlled from the system control MICRO COM. (SY). Impossible to read/write with the EEPROM (DPR-141 board/IC501).
Er91-13F	Read/write error from the system control (SY) MICRO COM. to the cassette memory. Error was detected when reading/writing from the cassette memory terminal (SE-298 board/MIC connector) to the cassette memory.
Er91-143	Communication (parity) error of data from the mechanism control (SV) MICRO COM. to the system control (SY) MICRO COM.
Er91-173	Communication (parity) error of data from the signal processor control (SP) MICRO COM. to the system control (SY) MICRO COM.
Er91-1F3	Communication (parity) error of data from the index picture (IP) MICRO COM. to the system control (SY) MICRO COM.
Er91-1F5	Communication is impossible between the system control (SY) MICRO COM. and the index picture (IP) MICRO COM. Clock (SCLK) is not input from the index picture (IP) MICRO COM. A communication is not completed within a specified time.
Er91-213	Communication (parity) error of data from the system control (SY) MICRO COM. to the LCD/time code control (KY) MICRO COM.
Er91-215	Communication is impossible from the system control (SY) MICRO COM. to the LCD/time code control (KY) MICRO COM. A communication is not completed within a specified time.
Er91-232	Error of the EEPROM controlled from the LCD/time code control (KY) MICRO COM. (SY). Read/write with the EEPROM (FP-118 board/IC204) is impossible.
Er91-285	Communication error from the time code IC (FP-118 board/IC201) to the LCD/time code control (KY) MICRO COM.
Er91-413	Communication (parity) error of data from the system control (SY) MICRO COM. to the mechanism control (SV) MICRO COM.
Er91-415	Communication is impossible between the mechanism control (SV) MICRO COM. and the system control (SY) MICRO COM. Clock (SCLK) is not input from the system control (SY) MICRO COM. A communication is not completed within a specified time.
Er91-433	Error of the EEPROM controlled from the mechanism control (SV) MICRO COM. Impossible to read/write with the EEPROM (HN-227 board/IC1).
Er91-434	Error of the EEPROM controlled from the mechanism control (SV) MICRO COM. Impossible to read/write with the EEPROM (RP-91 board/IC770).
Er91-473	Communication (parity) error of data from the signal processor control (SP) MICRO COM. to the mechanism control (SV) MICRO COM.
Er91-475	Communication is impossible between the mechanism control (SV) MICRO COM. and the signal processor control (SP) MICRO COM. Clock (SCLK) is not input from the signal processor control (SP) MICRO COM. A communication is not completed within a specified time.
Er91-743	Communication (parity) error of data from the mechanism control (SV) MICRO COM. to the signal processor control (SP) MICRO COM.
Er91-F13	Communication (parity) error of data from the system control (SY) MICRO COM. to the index picture (IP) MICRO COM.
Er91-1d5	Communication is impossible between the SY MICRO COM. and the DV MICRO COM. A communication is not completed within a specified time.

Error codes	Contents
Er91-1d3	Parity error occurred in communication between the SY MICRO COM. and the DV MICRO COM.
Er92-100	The system control (SY) MICRO COM. cannot detect 1/2 VD signal (SV-213 board/IC500) or SVTRKD signal (SV-213 board/IC500) from the mechanism control (SV) MICRO COM.
Er92-200	The display/function control (KY) MICRO COM. cannot detect 1/2 VD signal.
Er92-F00	The index picture (IP) MICRO COM. cannot detect 1/2 VD signal or SVTRKD signal.
Er93-000	The mechanism control (SV) MICRO COM. cannot detect FLTD signal (DPR-141 board/IC711) from the DPR-141 board.
Er95-100	Communication (parity) error of data from the AUX IC (DPR-141 board/IC772) to the system control (SY) MICRO COM.
Er95-101	Communication (parity) error of data from the FSCONT IC (DPR-141 board/IC825) to the system control (SY) MICRO COM.
Er95-102	Communication (parity) error of data from the NFIL IC (DPR-141 board/IC505) to the system control (SY) MICRO COM.
Er95-103	SY MICRO COM. failed in communication to the YC Sep. IC (IV-54 board/IC112).
Er95-120	CF pulse is not input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-123	Error of digital data (2) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-124	Error of digital data (3) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-125	Error of digital data (4) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-126	Error of digital data (5) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-127	Error of digital data (6) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-128	Error of digital data (7) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-129	Error of digital data (8) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-12R	Error of digital data (9) input from the RC IC (DPR-141 board/IC310) to the NFL IC (DPR-141 board/IC505).
Er95-403	Communication (parity) error of data from the SFY IC (DPR-141 board/IC771) to the mechanism control (SV) MICRO COM.
Er95-405	Communication (parity) error of data from the CHCD IC (RP-91 board/IC774) to the mechanism control (SV) MICRO COM.
Er95-703	Communication (parity) error of data from the SFY IC (DPR-141 board/IC771) to the signal processor control (SP) MICRO COM.
Er95-704	Communication (parity) error of data from the AUDIO CORE (DPR-141 board/IC811) to the signal processor control (SP) MICRO COM.
Er95-F10	Communication (parity) error of data from the IP IC (IPM-94 board/IC101) to the index picture (IP) MICRO COM.
Er95-F11	Write processing error from the IP IC (IPM-94 board/IC101) to the memory (IPM-94 board/IC102).
Er95-F12	Write processing error from the frame memory (IPM-94 board/IC201 to IC214, IC301 to IC314) to a tape controlled by IP IC (IPM-94 board/IC101).

Operations when Error Occurs

When a communication error and communication not possible (Error91 to Error95) occur, only an error display appears and the unit does not stop its operation.

Possible Failures

- Microprocessor or device
- Destination IC of the microprocessor
- Connection between board to board or connector

Note: Digital data (0) to digital data (12) shown Er95-120 through Er95-12A indicate numbers of the digital video data bus.

Error occurs when data is not input to the NFIL IC or is not read correctly.

4-5. SELF DIAGNOSIS

The self diagnosis is performed with service mode operation.
Refer to section 5-2.1. for the operating procedure of the service mode.

• Page 22 Self Diagnosis 2

PAGE 22 (NEXT→▼ PREV→▲)	
ERROR DISP 1/3	
→ DISP SELECT :	1
PP-PMPD :	000H
PR-PMPD1 :	000H
PR-PMPD2 :	000H
PR-G2 :	000H
PR-R2 :	000H
EXIT MENU (YES→PUSH)	

DISP SELECT

This item is used for switching the contents of error item detail display.

1. The latest error check result is displayed.
2. The item which diagnosed as an error in the past by means of automatic self-diagnosis function is displayed.

PP-PMPD

This item shows a detail of the sync signal input check result and internal RAM check result of PP LSI (IC210 on the DPR board).

800H: PP LSI's internal RAM error

002H: HD signal input to PP LSI (pin 102 of IC210/DPR board) error

001H: VD signal input to PP LSI (pin 101 of IC210/DPR board) error

Note: If there is a plural error, the sum of each error code is displayed as three digits hexadecimal notation.
(If there are errors in both HD and VD signals, 003H is displayed on the PP-PMPD.)

PR-PMPD1

This item shows a detail of the sync signal input check result of PR LSI (IC216 on the DPR board).

002H: HD signal input to PR LSI (pin 74 of IC216/DPR board) error

001H: VD signal input to PR LSI (pin 73 of IC216/DPR board) error

PR-PMPD2

This item shows a detail of the internal RAM check result of PR LSI (IC216/DPR board).

800H: PR LSI's internal RAM error

PR-G2

Not in use

PR-R2

Not in use

• Page 23 Self Diagnosis 3

PAGE 23 (NEXT→▼ PREV→▲)	
ERROR DISP 2/3	
→ DISP SELECT :	1
PR-G1 :	000H
PR-R1 :	000H
PR-G0 :	000H
PR-R0 :	000H
PR-B1 :	000H
EXIT MENU (YES→PUSH)	

PR-G1
Not in use

PR-R1
Not in use

PR-G0
Not in use

PR-R0
Not in use

PR-B1
Not in use

• Page 24 Self Diagnosis 4

PAGE 24 (NEXT→▼ PREV→▲)	
ERROR DISP 3/3	
→ DISP SELECT :	1
RC- PMPD :	000H
RC- CY :	000H
RC- CCR :	000H
RC- CCB :	000H
DSP COM. :	000H
MEMORY :	000H
EXIT MENU (YES→PUSH)	

RC-PMPD

This item shows a detail of sync signal input check result and internal RAM check result of RC LSI (IC310 on the DPR board).

800H: RC LSI's internal RAM error
004H: HD signal input to RC LSI (pin 65 of IC310/DPR board) error
002H: VD signal input to RC LSI (pin 64 of IC310/DPR board) error
001H: GF signal input to RC LSI (pin 63 of IC310/DPR board) error

RC-CY

This item shows a detail of Y signal's wiring check result between PR LSI (IC216/DPR board) and RC LSI (IC310/DPR board).

400H: 10th of Y signal (wiring between pin 94 of IC216 and pin 97 of IC310 on the DPR board) error
200H: 9th of Y signal (wiring between pin 93 of IC216 and pin 98 of IC310 on the DPR board) error
100H: 8th of Y signal (wiring between pin 92 of IC216 and pin 99 of IC310 on the DPR board) error
080H: 7th of Y signal (wiring between pin 91 of IC216 and pin 100 of IC310 on the DPR board) error
040H: 6th of Y signal (wiring between pin 90 of IC216 and pin 101 of IC310 on the DPR board) error
020H: 5th of Y signal (wiring between pin 89 of IC216 and pin 103 of IC310 on the DPR board) error
010H: 4th of Y signal (wiring between pin 88 of IC216 and pin 104 of IC310 on the DPR board) error
008H: 3rd of Y signal (wiring between pin 86 of IC216 and pin 105 of IC310 on the DPR board) error
004H: 2nd of Y signal (wiring between pin 85 of IC216 and pin 106 of IC310 on the DPR board) error
002H: 1st of Y signal (wiring between pin 84 of IC216 and pin 107 of IC310 on the DPR board) error
001H: 0th of Y signal (wiring between pin 83 of IC216 and pin 108 of IC310 on the DPR board) error

RC-CCR

Not in use

RC-CCB

Not in use

DSP COM.

This item shows a detail of the communication check result between each LSI and microcomputer.

004H: communication error between RC LSI and microcomputer

002H: communication error between PR LSI and microcomputer

001H: communication error between PP LSI and microcomputer

Note: The RC LSI performs the data communication to a microcomputer with the following six signals:

Pin 26: CS Pin 23: SDA1

Pin 25: SCK Pin 22: SDA2

Pin 24: SDA0 Pin 21: SDA3

The PR LSI performs the data communication to a microcomputer with the following six signals:

Pin 58: CS Pin 55: SDA1

Pin 57: SCK Pin 54: SDA2

Pin 56: SDA0 Pin 53: SDA3

The PP LSI performs the data communication to a microcomputer with the following six signals:

Pin 41: CS Pin 38: SDA1

Pin 40: SCK Pin 37: SDA2

Pin 39: SDA0 Pin 36: SDA3

If an error is detected during the data communication with LSI, other error item may be detected at the same time.

MEMORY

This item shows a detail of the communication check result between each EEPROM and microcomputer.

080H: communication error between EEPROM (IC103) on the ES board and microcomputer

040H: communication error between EEPROM (IC301) on the DPR board and microcomputer

020H: communication error between EEPROM (IC1) on the TG board and microcomputer

010H: communication error between EEPROM (IC504) on the AT board and microcomputer

Note: When the back up data is used because of an error in EEPROM on the TG, DPR, and ES boards, and when the micro computer's standard value is used because of an error in EEPROM on the AT board, indication of each EEPROM on the service menu will show a blank.

4-6. AUTO CHECK FUNCTION

The error contents, measures and the possible abnormalities are as follows when the following codes are displayed as the result of Auto Check.

(Refer to Section 1 Operating Instructions for the operating procedure of the Auto Check Function.)

Displays, Error Contents, Measures or Possible Abnormalities

Displays	Error contents, measures or possible abnormalities
At good	The system can be used as it is when the recording status of video and audio is normal.
At ng-01	This is an error during normal operation. Exit from the menu by pressing the MENU button. (To return to the status before displaying the VTR menu.) The error code remains displayed. Analyze the cause of the error by referring to Section "4-1. ERROR CODES" for the contents of the error.
At ng-02	When the RESET (MENU SET) button is kept pressed for about two seconds while "At ng-02" is displayed, the two digit error code appears. Analyze the cause of the error by referring to error code of the auto check code.
At ng-03	Exit from the menu by pressing the MENU button. (To return to the status before displaying the VTR menu.) When any of the error codes from Er95-120 to Er95-12A is displayed, analyze the cause of the error by referring to Section "4-1. ERROR CODES" for the contents of the error. If any error codes are not displayed, this is the condition that the sync signal is not fed to IC3 of the FP-118 board from a camera. If result of the Auto Check remains unchanged even though the Auto Check is performed again after confirming connection between VTR and camera, the following causes are possible. Causes (possible abnormalities) <ul style="list-style-type: none">• Circuit is shorted.• Circuit is open.
At ng-04	It is detected that "A cassette is in the REC INHIBIT (SAVE) status." If result of the Auto Check remains unchanged even though the Auto Check is performed again after confirming that the REC/SAVE switch of a cassette is not set in the SAVE position (if the switch is set in SAVE, set it to the REC position, or use another cassette (switch of which is set in REC.)) Causes (possible abnormalities) <ul style="list-style-type: none">• The REC INHIBIT detection switch of a VTR is defective.• The circuit from the REC INHIBIT detection switch to IC502 pin-14 of the SV-213 board is defective. (Circuit is shorted or open, or poor contact of connector.)
At ng-05	It is detected that "Cassette is not present even though a cassette is inserted." If result of the Auto Check remains unchanged even though the Auto Check is performed again after inserting another cassette, the following causes are possible. Causes (possible abnormalities) <ul style="list-style-type: none">• A cassette compartment is defective.• Tape top end sensor, or LED (including prism) or its peripheral circuit is defective. (Circuit is shorted or open, or poor contact of connector.)
o-HAUL	It is detected that "Error rate is deteriorated (The readout error during playback of the recorded video/audio data has increased.)" The system can be used as it is when the recording status of video and audio is normal, however, the following causes are possible. Causes (possible abnormalities) <ul style="list-style-type: none">• Head is dirty.• Tape path is poor.• The RP-91 board is defective.• Poor contact of the flexible card wires which are connected to the RP-91 board.

Auto Check Error Code

If “At ng-02” is displayed as the result of Auto Check and when the RESET (MENU SET) button is kept pressed for about two seconds while “At ng-02” is displayed, the two digit error code appears.

Displays, Error Contents, Measures or Possible Abnormalities

Code	Error contents, measures or possible abnormalities
00	It is in the status that the data other than the video and audio data which is recorded on a tape, cannot be read out. The signal circuit from the head of drum to IC of the DPR-141 board is abnormal. Causes (possible abnormalities) <ul style="list-style-type: none">• Poor contact of connectors• Head clogging• The RP-91 board is defective.• The MB-833 board is defective.• The DPR-141 board is defective.
other than 00 The error contents, measures and possible abnormalities are different depending upon the respective processes. (Refer to the following.)	

1. Cassette Out

When the Auto Check is performed, the cassette compartment is automatically opened (when a cassette is present, it is ejected), and the Auto Check is performed during the period from the time when user inserts a cassette until the cassette compartment is closed. When any abnormalities are detected, the error code is displayed.

Displays, Error Contents, Measures or Possible Abnormalities

Code	Error contents, measures or possible abnormalities
12	The cassette compartment is locked.
13	The cassette compartment is not attached.
18	Tape top sensor does not respond.
19	Tape end sensor does not respond.
1a	Both tape top and tape end sensors do not respond.
1a	LEDs of the tape top end sensor are abnormal. ON/OFF voltage is abnormal.
20	The function cam does not enter the STBY mode.
21	LED of the mechanical function cam mode sensor is abnormal.
22	LED of the mechanical function cam mode sensor is abnormal.
23	LED of the mechanical function cam mode sensor is abnormal.
24	LED of the mechanical function cam mode sensor is abnormal.
28	The detection voltage/current of the function cam motor does not return to 0.
38	The detection voltage/current of the drum motor does not return to 0.
48	The detection voltage/current of the capstan motor does not return to 0.
50	LED of the supply reel FG sensor is abnormal.
70	LED of the take-up reel FG sensor is abnormal.
c1	LED of the reel position (standard cassette position) sensor is abnormal.
c2	LED of the reel position (mini cassette position) sensor is abnormal.
c8	The detection voltage/current of the reel shift motor does not return to 0.

2. Cassette In

Insert a cassette into the cassette compartment and close the lid of the cassette compartment.

Check is performed during tape loading. When any abnormalities are detected, the error code is displayed.

Displays, Error Contents, Measures or Possible Abnormalities

Code	Error contents, measures or possible abnormalities
12	The cassette compartment lock is released.
1a	"Tape is present" is not detected.
1a	LEDs of the tape top end sensor are abnormal.
20	Positions of the function cam are not detected in the correct order.
21	LED of the mechanical function cam mode sensor is abnormal.
22	LED of the mechanical function cam mode sensor is abnormal.
23	LED of the mechanical function cam mode sensor is abnormal.
24	LED of the mechanical function cam mode sensor is abnormal.
50	LED of the supply reel FG sensor is abnormal.
70	LED of the take-up reel FG sensor is abnormal.
c1	LED of the reel position (standard cassette position) sensor is abnormal.
c2	LED of the reel position (mini cassette position) sensor is abnormal.
d0	The free running frequency of PLL on the RP-91 board is abnormal.

3. Record

Press the VTR button of the camera or the lens.

Check is performed during the test recording of about one minute. When any abnormalities are detected, the error code is displayed.

Displays, Error Contents, Measures or Possible Abnormalities

Code	Error contents, measures or possible abnormalities
12	The cassette compartment lock is released.
18	Tape top is detected.
1a	LEDs of the tape top end sensor are abnormal.
21	LED of the mechanical function cam mode sensor is abnormal.
22	LED of the mechanical function cam mode sensor is abnormal.
23	LED of the mechanical function cam mode sensor is abnormal.
24	LED of the mechanical function cam mode sensor is abnormal.
28	The operating voltage/current of the function cam motor is abnormal.
38	The operating voltage/current of the drum motor is abnormal.
40	The duty ratio of the capstan FG (A) and FG (B) are abnormal.
48	The operating voltage/current of the capstan motor is abnormal.
50	LED of the supply reel FG sensor is abnormal.
70	LED of the take-up reel FG sensor is abnormal.
98	Operating voltage/current of the reel motor is abnormal.
c1	LED of the reel position (standard cassette position) sensor is abnormal.
c2	LED of the reel position (mini cassette position) sensor is abnormal.
c8	The operating voltage/current of the reel shift motor is abnormal.

4. Cue Up To Record Start Point

After tape is recorded for about one minute, tape is rewound up to the record start point.

Check is performed during the period from the time when recording is terminated automatically until the tape is rewound up to the record start point. When any abnormalities are detected, the error code is displayed.

Displays, Error Contents, Measures or Possible Abnormalities

Code	Error contents, measures or possible abnormalities
12	The cassette compartment lock is released.
19	Tape end is detected.
1a	LEDs of the tape top end sensor are abnormal.
21	LED of the mechanical function cam mode sensor is abnormal.
22	LED of the mechanical function cam mode sensor is abnormal.
23	LED of the mechanical function cam mode sensor is abnormal.
24	LED of the mechanical function cam mode sensor is abnormal.
28	The operating voltage/current of the function cam motor is abnormal.
38	The operating voltage/current of the drum motor is abnormal.
48	The operating voltage/current of the capstan motor is abnormal.
50	LED of the supply reel FG sensor is abnormal.
70	LED of the take-up reel FG sensor is abnormal.
98	Operating voltage/current of the reel motor is abnormal.
c1	LED of the reel position (standard cassette position) sensor is abnormal.
c2	LED of the reel position (mini cassette position) sensor is abnormal.
c8	The operating voltage/current of the reel shift motor is abnormal.

5. Playback

The recorded segment is played back.

Check is performed during playback. When any abnormalities are detected, the error code is displayed.

Displays, error contents, measures or possible abnormalities

Code	Error contents, measures or possible abnormalities
12	The cassette compartment lock is released.
18	Tape top is detected.
1a	LEDs of the tape top end sensor are abnormal.
21	LED of the mechanical function cam mode sensor is abnormal.
22	LED of the mechanical function cam mode sensor is abnormal.
23	LED of the mechanical function cam mode sensor is abnormal.
24	LED of the mechanical function cam mode sensor is abnormal.
28	The operating voltage/current of the function cam motor is abnormal.
30	The SSA (switching position) is incorrect.
38	The operating voltage/current of the drum motor is abnormal.
48	The operating voltage/current of the capstan motor is abnormal.
50	LED of the supply reel FG sensor is abnormal.
70	LED of the take-up reel FG sensor is abnormal.
98	Operating voltage/current of the reel motor is abnormal.
c1	LED of the reel position (standard cassette position) sensor is abnormal.
c2	LED of the reel position (mini cassette position) sensor is abnormal.
c8	The operating voltage/current of the reel shift motor is abnormal.
e0	The system data that is read from IC774 on the RP-91 board, and the system data that is read from IC771 on the DPR-141 board are abnormal. (The system data: The recorded data that can be read when the servo is locked.)
e1	The system data (the system data is the recorded data that can be read when the servo is locked) is abnormal. (The respective data of ABS Track No., time code pack and bin pack must be free from errors.)

SECTION 5

MENU SETTING

5-1. MENU (LCD)

The display window (LCD) of this unit enables setting of the system functions of this unit, and VTR menus required for adjustments and maintenance.

The VTR menus are divided into the following three:

- **USER MENU**
For user operations.
- **SYSTEM MENU**
Used to set various system functions of this unit (This menu is not described in the instruction manual and therefore cannot be used by users.)
- **MAINTENANCE MENU**
Used for performing maintenance including adjustments.

5-1-1. User Menu

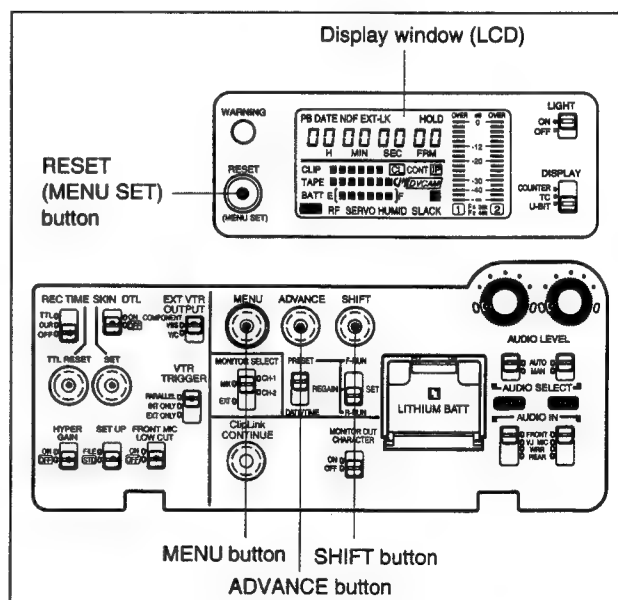
Operating the USER MENU

1. Press the MENU button in the TC panel.
(The time data on the display window changes to the menu display.)
The display window (LCD) displays "101 xxxx" and the USER MENU is set. (Fig. A.)
2. Press the ADVANCE button repeatedly until the Menu No. on the display window (LCD) becomes the desired Menu No.
Pressing the ADVANCE button (+ button) will switch and display the menu in the following order.
101 → 201 → 204 (DSR-500WS)/206 (DSR-500WSP) ...221(DSR-500WS)/214 (DSR-500WSP) → 101...
3. To display the desired Menu No., press the SHIFT button. The current value setting will blink, the value will be enabled to be changed. (Fig. B.)
4. To advance to the next digit, press the SHIFT button.
To change the set value, press the ADVANCE button and display the desired value.
5. Press the RESET (MENU SET) button.
The set value is registered, and the Menu No. blinks again. (Fig. C.)
6. Press the MENU button.
The display window (LCD) returns to the state before the menu display.

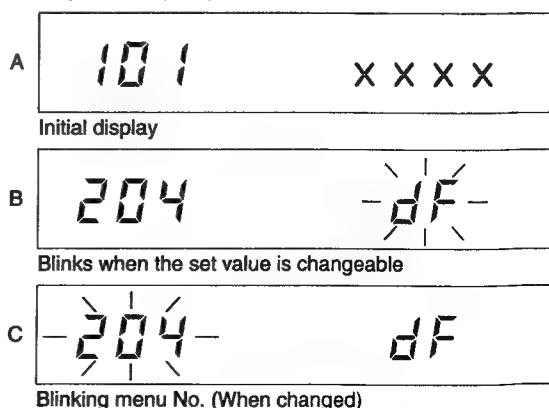
Note: If the MENU button is pressed during operations, the menu will be exited without registering changes made in the settings.

Basic Operations of Buttons

Button	Function
ADVANCE button	Changes the set value Menu No. + (Increase)
SHIFT button	Moves between displayed digits Menu No. - (Decrease)
RESET (MENU SET) button	Registers the set value (Returns to the menu selection mode) Starts the adjustment
MENU button	Returns to the state before the menu mode Interrupts the adjustment



Display window (LCD)



☐ is the factory setting

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
101	—	101 1997	ADV. SHIFT	Sets the calendar and clock. Use the SHIFT button to move between the digits to be set. (Year → Month → Day → X0 Hours → 0X Hours → X0 Minutes → 0X Minutes → X0 Seconds → 0X Seconds → Year)
201	HOURS METER DISPLAY	201 x x x x	SHIFT	Displays how long the head drum was used, how long the tape was driven, and operating time in order. A: How long the head drum was used b: How long the tape was driven C: Operating time (When power is turned ON) *Each time Menu No. 201 is displayed and the SHIFT button is pressed, the display changes in the following order. (201 → A → b → C → 201)
204	FRAME MODE SELECTION For DSR-500WS (UC)	204 dF [dF]/ndF	ADV.	Selects the time code generator drop frame mode and non-drop frame mode dF: Drop frame mode ndF: Non drop frame mode
206	BATTERY REMAINDER DISPLAY SELECTION	206 Std [Auto]/nl/LI/Antn	ADV.	Sets/switches the battery remainder display. LI: Lithium ion battery (BP-L40/L60/L60A/L90/L90A) Antn: Anton battery Std: Standard battery display (NP-1B, BP-90A)
207	STANDBY TIMER SETTING	207 08 01/03/05/[08]	ADV.	Sets the time for releasing the standby mode. Can be selected from one minute, 3 minutes, 5 minutes, and 8 minutes.
210	AUTO CHECK FUNCTION SETTING	210 oFF [oFF]/on	ADV.	Automatically inspects if there are any problems in the basic operations of this unit, connections between this unit and the camera before starting to shoot. When oFF is displayed: When the RESET button is pressed, auto check is not performed, and instead, Menu No. is displayed again. When on is displayed: When the RESET button is pressed, auto check is started. After auto check is complete, press the MENU button to exit from the menu mode.
211	CLIP LINK FUNCTION SETTING	211 on [on]/oFF	ADV.	Setting when the clip link shooting is not executed. on: Clip link function ON oFF: Clip link function OFF
212	AUDIO RECORDING MODE SETTING	212 48 [48]/32	ADV.	Sets audio signal recording mode 48: 48 kHz 2 channel mode 32: 32 kHz 4 channel mode (Records CH-1, CH-2 only)

- For details on the USER MENU, refer to the Instruction Manual or Section 1.
- Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button.

☐ is the factory setting

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
213	AUDIO REFERENCE LEVEL SELECTION	<div>213 -20</div> <div>-20/-12</div>	ADV.	Selects the audio reference level. -20: -20 dB (DSR-500WS) -18: -18 dB (DSR-500WSP) -12: -12 dB
214	AUDIO FADE SELECTION	<div>214 OFF</div> <div>on/OFF</div>	ADV.	Selects the fade in/fade output mode at the starting and ending points of audio recording. on: Fades in/out. OFF: No fades in/out.
220	SETUP ADD SELECTION <For DSR-500WS (UC)>	<div>220 OFF</div> <div>on/OFF</div>	ADV.	Set when adding setup to the video signal during playback.
221	SETUP REMOVE SETTING	<div>221 OFF</div> <div>on/OFF</div>	ADV.	Set when eliminating setup from the video signal that the setup is added to during recording.

- For details of the USER MENU, refer to the Instruction Manual or Section 1.
- Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button.

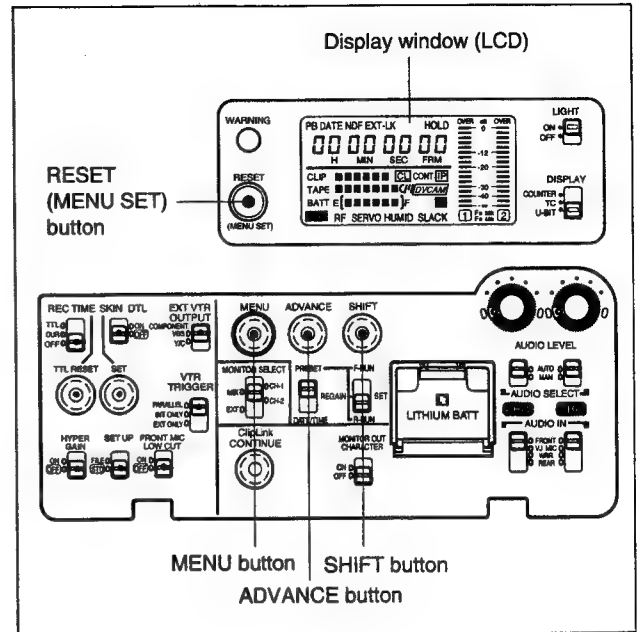
Basic Operations of Buttons

Button	Function
ADVANCE button	Changes the set value Menu No. + (Increase)
SHIFT button	Moves between displayed digits Menu No. - (Decrease)
RESET (MENU SET) button	Registers the set value (Returns to the menu selection mode)
MENU button	Returns to the state before the menu mode

5-1-2. System Menu

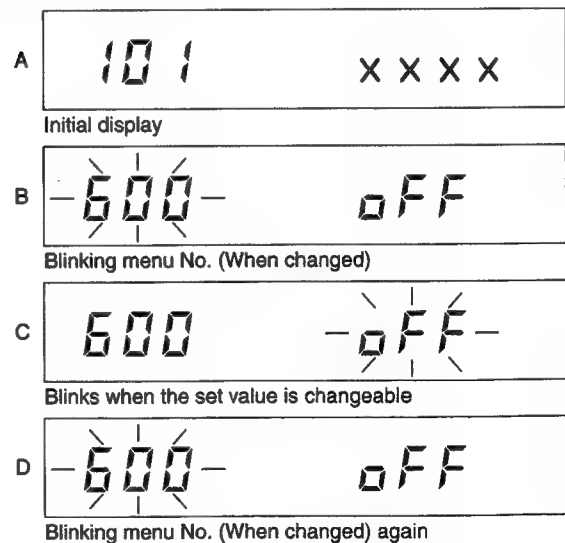
Operating the SYSTEM MENU

1. Press the MENU button while pressing the SHIFT button in the TC panel. "101 xxxx" is displayed on the display window (LCD). (Fig. A.)
Release the SHIFT button while pressing the MENU button.



2. After about 1 second, check that "600 off" is displayed, and release the MENU button. (Fig. B.)
3. Press the ADVANCE button or SHIFT button repeatedly until the Menu No. on the display window (LCD) becomes the desired Menu No.
Pressing the ADVANCE button (+ button) will switch and display the menu in the following order.
600 → 301 → 308 → 401 → 402...513 → 600...
Pressing the SHIFT button (− button) will switch and display the menu in the following order.
600 → 513 → 509 → 503...301 → 600...
4. Display the desired Menu No., press the RESET (MENU SET) button.
The current value setting will blink, the value will be enabled to be changed. (Fig. C.)
5. Press the ADVANCE button and display the desired value.
6. Press the RESET (MENU SET) button. The set value is registered. The Menu No. blinks again. (Fig. D.)
7. Press the MENU button.
The display window (LCD) returns to the state before the menu display.

Display window (LCD)



☐ is the factory setting

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
301	CCZ MIC LEVEL SELECT	<div>301 OFF</div> <div>on/OFF</div>	ADV.	CCZ MIC LEVEL SELECT on: -60 dBu off: -20 dBu
308	TC PHASE CORRECTION ON/OFF SELECT	<div>308 ON</div> <div>on/OFF</div>	ADV.	Selects whether to perform phase correction or not. on: TC bit 0 starts from Low. off: TC bit 0 start is undefined. Normally set to ON.
401	BACK TALLY MODE SELECT	<div>401 OFF</div> <div>on/OFF</div>	ADV.	Selects BACK TALLY mode. on: Real REC mode off: REC mode and WARNING display
402	HUMID MODE SELECT	<div>402 OFF</div> <div>on/OFF</div>	ADV.	on: Even if condensation occurs, REC operation is continued if VTR is set to REC mode. At other times, same as OFF. off: When condensation occurs, HUMID ALARM is displayed to protect the tape. VTR stops operating only for a certain period of time when set by HUMID TIMER. (Refer to Section 4-3 for details.)
403	ROM VERSION DISPLAY	<div>40354x x x</div>	RESET	When the RESET button is pressed, the subject switches accordingly in the order KY → SY → SV → SP → IP → DV → KY and the ROM version is displayed. (The display on the left shows the case the SY microcomputer is selected.)
405	STANDBY OFF INHIBIT ON/OFF	<div>405 OFF</div> <div>on/OFF</div>	ADV.	Selects whether to perform STANDBY OFF operation or not. on: STANDBY OFF operation is prohibited. Therefore STANDBY OFF is not performed. off: STANDBY OFF is performed at the time set by the STANDBY TIMER.
406	PB TC OUT SELECT	<div>406 OFF</div> <div>on/OFF</div>	ADV.	Selects PB TC OUT. on: PB TC is output during playback. off: PB TC is not output. (TC is output from the generator at all times.)
501	BATTERY BEFORE	<div>501 x x x</div>	ADV. SHIFT RESET	The battery before end (near end of battery life) voltage can be set within the 11.0 V to 12.5 V range. (Refer to Section 3-14 for the changing method.)
502	BATTERY END	<div>502 x x x</div>	ADV. SHIFT RESET	The battery end (end of battery life) can be set within the 11.0 V to 12.5 V range. (Refer to Section 3-14 for the changing method.)

Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button.

Note: Even if Menu No. 600 is "on," it will automatically go "off" when the power is turned OFF.

☐ is the factory setting

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
503	CALENDAR DISPLAYS	<div>503 x x x</div> <div>Std/UC/J/CE</div>	ADV.	Selects window (LCD) date display (Setting format of U-BIT with TC mode switch 1/TC panel set to DATE/TIME) Std: According to internal DIP SW (NTSC is UC/J, PAL is CE only) J: Year/month/day UC: Month/day/year CE: Date/month/year
509	HUMID TIMER OFF	<div>509 x x x</div>	RESET	Releases HUMID TIMER When set to HUMID MODE OFF at factory setting Menu No. 402, HUMID ALARM is displayed to protect the tape, and VTR stops operations only for a certain period of time set by the HUMID TIMER when condensation occurs. However, when condensation is removed manually, the HUMID TIMER can be released at the menu. (For details on how to release the HUMID TIMER, refer to Section 4-3.)
513	BP BATTERY PRESET	<div>513 x x x</div>	ADV. SHIFT RESET	The BP battery preset voltage can be set within the 12.0 to 15.9 V range. (Refer to Section 3-14. for how to replace.)
522	SERIAL NO. SETTING	<div>522</div>	ADV. SHIFT RESET	Destination setting 1. Press the RESET (MENU SET) button and display the "type". 2. Set the destination. UC: 00, J:01, CE:02 3. Press the RESET (MENU SET) button. The set value is registered, and the Serial No. screen is displayed. Serial No. (under four digits) setting. 4. Check that "no" is displayed on the LCD, and set the Serial No. (under four digits). 5. Press the RESET (MENU SET) button and registers the Serial No.
523	SERIAL NO. CHECK	<div>523</div>	RESET	Check the Serial No. at current. <div> <div>02 0814</div> <div>→ Destination</div> <div>→ Serial No.(under four digits)</div> </div> When using M523, the LCD displays as above.
600	MAINTENANCE MENU ON/OFF SELECT	<div>600 off</div> <div>on/off</div>	ADV.	Sets the MAINTENANCE MENU (menu No. 601 to 755) to ON/OFF. on: MAINTENANCE MENU are displayed and setting changeable. off: MAINTENANCE MENU are not displayed.

Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button.

Basic Operations of Buttons

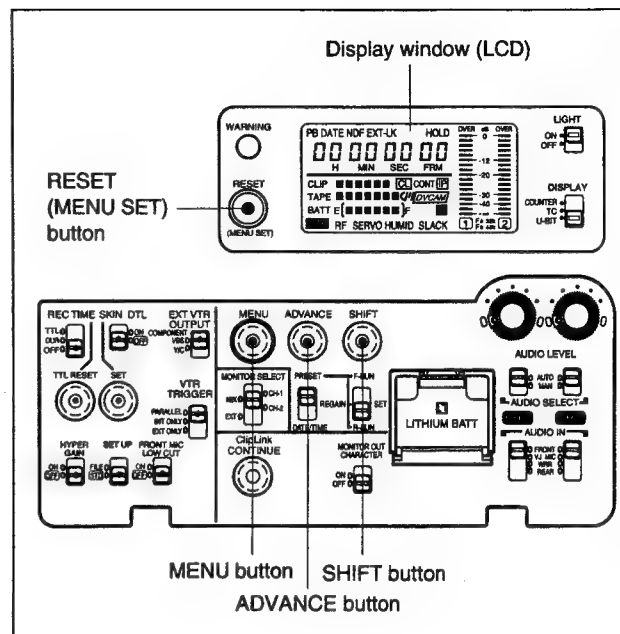
Button	Function
ADVANCE button	Changes the set value Menu No. + (Increase)
SHIFT button	Moves between displayed digits Menu No. - (Decrease)

Button	Function
RESET (MENU SET) button	Registers the set value (Returns to the menu selection mode) Starts the adjustment
MENU button	Returns to the state before the menu mode Interrupts the adjustment

5-1-3. Maintenance Menu

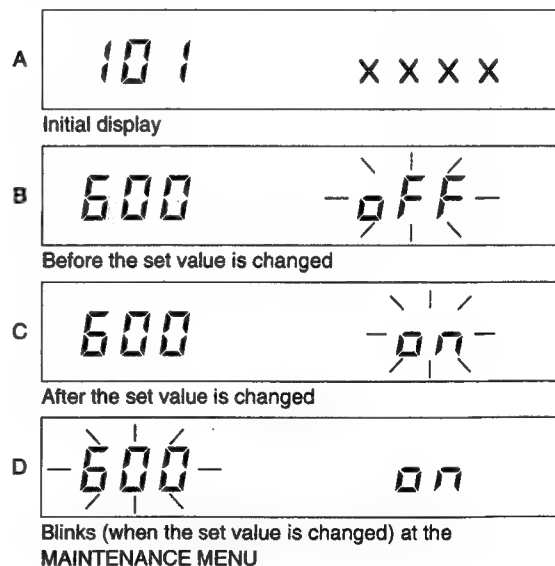
Operating the MAINTENANCE MENU

1. Press the MENU button while pressing the SHIFT button in the TC panel. "101 xxxx" is displayed on the display window (LCD). (Fig. A.)
Release the SHIFT button while pressing the MENU button.



2. Check that "600 off" is displayed one second later, and release the MENU button.
3. Press the RESET (MENU SET) button with Menu No. 600 displayed. ("off" blinks.) (Fig. B.)
4. Press the ADVANCE button and select "on." (Fig. C.)
5. Press the RESET button. ("600" blinks.) (Fig. D.)
This enables the MAINTENANCE MENU (Menu No. 600 to 755) to be set.
* Even if Menu No. 600 is set to "on," the SYSTEM MENU can be displayed and settings can be changed.
6. Press the ADVANCE button or SHIFT button repeatedly until the Menu No. on the display window (LCD) becomes the desired Menu No.
Pressing the ADVANCE button (+ button) will switch and display the menu in the following order.
600 → 601 → 603 → 604...513 → 600...
Pressing the SHIFT button (− button) will switch and display the menu in the following order.
600 → 513 → 509 → 503...601 → 600...
7. Press the RESET (MENU SET) button at the desired setting, and perform settings and adjustments at each menu.
8. Press the MENU button.
The display window (LCD) returns to the state before the menu display.

Display window (LCD)



Note: When the MENU button is pressed before results are displayed (during adjustments) for Menus No. 601, 605, 607, 608, and 609, "Abort" will be displayed and the adjustments will be stopped. This is displayed until normal operations can be performed (2 seconds at the shortest).

☐ is the factory setting

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
601	CAPSTAN FG DUTY ADJUSTMENT	<div>601 ----</div> <div>(Adjusting)</div>	RESET	When the RESET (MENU SET) buttons is pressed, capstan FG DUTY automatic adjustment is started. After the adjustment, data is written in the EEPROM, and the adjustment results are displayed on the display window (LCD) (YES or no). (For details, refer to Section 11 VTR Block Electrical Alignment.)
603	SLACK MUTE SETTING	<div>603 OFF</div> <div>on/OFF</div>	ADV.	Sets slack detection mute ON/OFF. on: Slack mute ON oFF: Slack mute OFF Press the RESET (MENU SET) button, and set slack mute ON/OFF using the ADVANCE button. Note) This setting is effective only while the power is turned ON. When the power is turned OFF, it is automatically turned OFF.
604	TRACKING ADJUSTMENT CENTER ITI MODE SELECTION	<div>604 OFF</div> <div>oFF/10/5/20</div>	ADV.	Selects single frequency during recording/playback and recording in the center ITI mode. OFF: when the normal recording/playback mode is set. 5: Single frequency is 5 MHz during recording 10: Single frequency is 10 MHz during recording 20: Single frequency is 20 MHz during recording Note) This setting is effective only while the power is turned ON. When the power is turned OFF, it is automatically turned OFF.
605	SWITCHING POSITION ADJUSTMENT	<div>605 ----</div> <div>(Adjusting)</div>	RESET	Performs automatic adjustments of the switching position. (For details, refer to Section 8 Tape Path Alignment.)
606	PLAYBACK MODE SELECTION	<div>606 Aut</div> <div>Aut/10/15</div>	ADV.	Selects playback mode. Aut: Data is detected and mode is automatically determined. 10: Fixed at SP mode. 15: Fixed at SSP mode.
607	REEL FG DUTY ADJUSTMENT	<div>60x ----</div> <div>(Adjusting)</div>	RESET	Automatically adjusts the reel FG DUTY. YES: Adjustment OK no: Adjustment NG (For details, refer to Section 11 VTR Block Electrical Alignment.)
608	REEL TORQUE ADJUSTMENT 1		STOP F.FWD REW EJECT	Adjusts the reel torque. YES: Ends after saving adjustment data. no: Adjustment NG and error cause (For details, refer to Section 7-38.)
609	REEL TORQUE ADJUSTMENT 2			Adjusts the reel torque. YES: Ends after saving adjustment data. no: Adjustment NG and error cause (For details, refer to Section 7-38.)

Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button. For basic operation of buttons, refer to the beginning of section 5-1. Menu (LCD).

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
610	CAPSTAN TEST MODE	<div>61x --</div> <p>(During test mode)</p>	RESET	Rotates the capstan at the fixed voltage.
611	REEL TEST MODE			Rotates the reel at the fixed voltage.
612	DRUM TEST MODE			Rotates the drum at the fixed voltage.
613	FUNCTION CAM TEST MODE		STOP EJECT	While the following buttons are pressed, performs threading/unthreading. STOP button: Performs threading. EJECT button: Performs unthreading.
660+ Page9	VTR D/A Y LEVEL ADJ.	<ul style="list-style-type: none">• DISPLAY WINDOW (LCD) <div>660 tAdj</div> <p>(Adjusting)</p> <ul style="list-style-type: none">• VIEWFINDER SCREEN (MONITOR) <div>→ PAGE 9 (NEXT→▼ PREV→▲) VTR Y : 130 VTR R-Y : 145 VTR B-Y : 145 R-Y DELAY : 128 B-Y DELAY : 128 EXIT MENU (YES→PUSH)</div> <div>→ PAGE 10 (NEXT→▼ PREV→▲) EE S-Y : 155 EE S-C : 155 VTR 8ST : 125 VTR SYNC : 100 PB VBS : 170 EXIT MENU (YES→PUSH)</div>	ADV. SHIFT RESET MENU DIAL	<ul style="list-style-type: none">• For details, refer to Section 11 VTR Block Electrical Alignment.• Regarding viewfinder screen (MONITOR) operation, refer to "Section 5-2. Menu (Viewfinder)."
	PB Y/B-Y DELAY ADJ.			
	PB Y/R-Y DELAY ADJ.			
	PB R-Y LEVEL ADJ.			
	PB B-Y LEVEL ADJ.			
660+ Page10	VTR PB Y SYNC LEVEL ADJ.			
	PB BURST LEVEL ADJ.			
	PB VBS LEVEL ADJ.			
	EE CHROMA LEVEL ADJ.			
	EE Y LEVEL ADJ.			
661+ page9	VTR D/A Y LEVEL ADJ.	<ul style="list-style-type: none">• DISPLAY WINDOW (LCD) <div>661 tAdj</div>		Adjustment with internal COLOR BARS signal possible.
	PB R-Y LEVEL ADJ.			
	PB B-Y LEVEL ADJ.			
661+ page10	PB Y SYNC LEVEL ADJ.	<ul style="list-style-type: none">• VIEWFINDER SCREEN (MONITOR)		
	PB BURST LEVEL ADJ.			
	VTR PB COMPOSITE LEVEL ADJ.			

Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button. For basic operation of buttons, refer to the beginning of Section 5-1. Menu (LCD).

- Note:**
- During SET indication: Initializing starts by pressing the RESET button.
 - During ESC indication: Menu returns to the "Menu Item Select Mode" by pressing the RESET button without start up the initializing.

MENU No.	MENU DESCRIPTION	DISPLAY WINDOW (LCD)	BUTTON USED	CONTENTS
700	REC CURRENT ADJ.	<div>700 x - x x</div> <p>(When changing data)</p>	RESET	For details, refer to Section 11 VTR Block Electrical Alignment.
701	PLL ADJ.	<div>x x x x x</div> <p>(When changing data)</p> <div>x x x n o</div> <p>(Save NG)</p>		
702	AGC DELAY ADJ.			
704	AUTO EQ ADJ.			
750	VA EEPROM (SY) INITIALIZE	<div>- - - - -</div> <p>(When changing data)</p>	RESET	Initialize the SY EEPROM (IC401) on the DPR-141 board. If "no" is displayed when pressing the RESET button, initializing data is not saved correctly.
751	VA EEPROM (SP) INITIALIZE	<div>- - - 5 E t</div> <p>(Starting initialization)</p>		Initialize the SP EEPROM (IC652) on the DPR-141 board. If "no" is displayed when pressing the RESET button, initializing data is not saved correctly.
752	KY EEPROM ECHO BACK DATA PRESET			Presetting results are displayed when pressing the RESET button. YES: Preset OK no: Preset NG
753	MECHANICAL CONTROL ADJ. ITEM INITIALIZE	<div>- - - E S C</div> <p>(Stopping initialization)</p>	ADV. RESET	Initialize the EEPROM (IC1) on the HN-227 board. Saved results of initializing data are displayed by pressing the RESET button. YES: Save OK noE0: Save NG or already initialized
754	ERROR HISTORY INITIALIZE			Initializing of error history can be performed. Saved results of initializing data are displayed by pressing the RESET button. YES: Save OK no: Save NG
755	RP ADJ. ITEM INITIALIZE			Initialize the EEPROM (IC770) on the RP-91 board. Saved results of initializing data are displayed by pressing the RESET button. YES: Save OK no: Save NG

Buttons used: RESET → RESET (MENU SET) button, ADV. → ADVANCE button, MENU → MENU button, SHIFT → SHIFT button. For basic operation of buttons, refer to the beginning of Section 5-1. Menu (LCD).

5-2. MENU (VIEWFINDER)

5-2-1. Operation of Service Mode

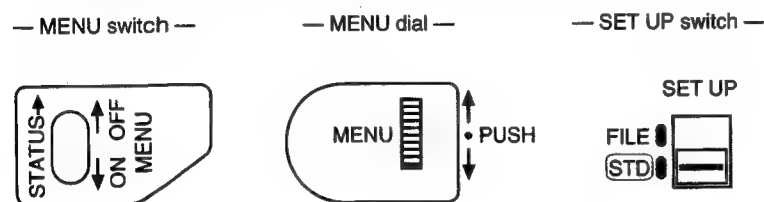
- **Service Mode**

There are the three major menus, BASIC menu and ADVANCE menu for user, and SERVICE menu.

The unit enters the service mode by setting the switch S811 (ADJ/OPE) on the FP-118 board to ADJ position.

- **Switches**

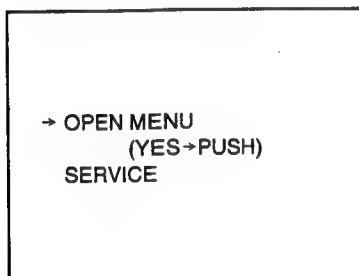
For details about switches, refer to section 1 Operating Instructions.



- **Menu Selection Screen**

The following menu select screen is displayed by setting the switch S811 on the FP-118 board to "ADJ" position.

Menu selection screen



- **Moving Cursor (→)**

Push the MENU switch toward on. Or, turn the MENU dial during blinking the cursor.

- **Menu Selection**

Turn the MENU dial during blinking the menu name. (By turning the MENU dial, menu name will be changed (SERVICE ⇔ BASIC ⇔ ADVANCE ⇔ FILE ⇔ SERVICE) cyclically.)

By pressing the MENU dial during blinking the menu name, cursor blinks.

- **Open the Service Menu (Proceed to Service Menu PAGE)**

1. Move the cursor to menu name. Set the mode to SERVICE by turning the MENU dial.
2. Push the MENU switch toward on, Move the cursor to OPEN MENU. Or, push the MENU dial (cursor blinks), and turn the MENU dial to move the cursor to OPEN MENU.
3. Push the MENU dial.

Normal menu operation can be performed after proceeding to PAGE of each menu.

When each menu has been closed, it is returned to the Menu Selection screen.

- **Connection**

Menu screen can be seen on the viewfinder screen or by the MONITOR OUT connector.

5-2-2. Reset Items and Standard Setting Value

Pages	Items	Standard Setting
4	M.PKNEE1	67
	M.PKNEE2	116
	M.PKNEE3	164
	M.PKNEE4	255
	R.PKNEE	128
	B.PKNEE	128
11 (For DSR-500WS)	SET UP	ON
	READ OUT	FD
	V BLKG	20H
11 (For DSR-500WSP)	COMP LEV	525
	READ OUT	FD
12	TEST	OFF
	R-Y	ON
	B-Y	ON
15	GAMMA	ON
	MATRIX	ON
	DETAIL	ON
	APERTURE	ON
	FLARE	ON
16	R TITLE	75
	G TITLE	75
	B TITLE	75
	R EDGE	0
	G EDGE	0
	B EDGE	0
17	M.GAMMA	132
	R GAMMA	±0
	B GAMMA	±0
(For DSR-500WS)	M.BLACK	2070
(For DSR-500WSP)	M.BLACK	2075
18	WHT CLIP	255
	IRIS GAIN	128
	IRIS MODE	100
	IRIS SET	144
(For DSR-500WS)	LOW LIGHT	144
(For DSR-500WSP)	LOW LIGHT	160

Pages	Items	Standard Setting
20	FILTER1	3200/3000 K
	FILTER2	5600 + 1/8ND
	FILTER3	5600 K
	FILTER4	5600 + 1/64ND
21	DIAG ERROR RESET	-
	MEMORY BACKUP	-
22	SELF DIAGNOSIS 1	1
23	SELF DIAGNOSIS 2	1
24	SELF DIAGNOSIS 3	1

5-2-3. Service Menu

• Page 1 RESET (For DSR-500WS)

```
→PAGE1 (NEXT→▼ PREV→▲)
RESET
  (YES→PUSH)
DEST : UC
ROM VER : ***

EXIT MENU (YES→PUSH)
```

All adjusting values with electronic volume control of each board that in unit-independent can be restored to their standard setting values.
(Refer to Section 5-2-2.)

* Move the cursor to "DEST" position, selects "UC," move the cursor to "RESET," and pressing the MENU dial.

(For DSR-500WSP)

```
→PAGE1 (NEXT→▼ PREV→▲)
RESET
  (YES→PUSH)
ROM VER : ***

EXIT MENU (YES→PUSH)
```

* Move the cursor to "RESET," and pressing the MENU dial.

• Page 2 Shading Correction

```
→PAGE2 (NEXT→▼ PREV→▲)
EXTENDER OFF
AUTO SHAD
  (YES→PUSH)
R W. SHAD : 128
G W. SHAD : 128
B W. SHAD : 128

EXIT MENU (YES→PUSH)
```

EXTENDER Current EXTENDER status display
AUTO SHAD Performing of AUTO SHADING correction
R W.SHAD/G W.SHAD/B W.SHAD
 White shading correction of V
 Standard (correcton 0) = 128

• Page 3 Flare Adjustment

```
→PAGE3 (NEXT→▼ PREV→▲)
R FLARE : 0
G FLARE : 0
B FLARE : 0

EXIT MENU (YES→PUSH)
```

R FLARE/G FLARE/B FLARE
 Flare correction
 (0 = no correction)

• Page 4 Pre Knee Setting

→PAGE4 (NEXT→▼ PREV→▲)	
M.PKNEE1 :	67
M.PKNEE2 :	116
M.PKNEE3 :	164
M.PKNEE4 :	255
R PKNEE :	128
B PKNEE :	128
EXIT MENU (YES→PUSH)	

		Standard Value
M.PKNEE1	Usual master pre-knee point:	67
M.PKNEE2	Master pre-knee point in gain is -3 dB:	116
M.PKNEE3	Master pre-knee point in FM mode:	164
M.PKNEE4	Master pre-knee point in GAIN-3dB & FM mode:	255
P PKNEE	Fine adjustment for the R channel's pre-knee point:	128
B PKNEE	Fine adjustment for the B channel's pre-knee point:	128

• Page 5 Camera COMP Level Adjustment

→PAGE5 (NEXT→▼ PREV→▲)	
W Y LEV :	120
W R-Y LEV :	100
W B-Y LEV :	100
Y LEV :	120
R-Y LEV :	111
B-Y LEV :	100
SYNC LEV :	80
SETUP LEV :	135
EXIT MENU (YES→PUSH)	

WY LEV	16:9 Camera Y level adjustment
W R-Y LEV	16:9 Camera R-Y level adjustment
W B-Y LEV	16:9 Camera B-Y level adjustment
Y LEV	4:3 Camera Y level adjustment
R-Y LEV	4:3 Camera R-Y level adjustment
B-Y LEV	4:3 Camera B-Y level adjustment
SYNC LEV	4:3 Camera SYNC level adjustment
SETUP LEV	Camera SETUP level adjustment (NTSC model only adjustable when setup is on.)

• Page 6 Camera CLP Level Adjustment

→PAGE6 (NEXT→▼ PREV→▲)	
Y CLP :	128
R-Y CLP :	120
B-Y CLP :	120
EXIT MENU (YES→PUSH)	

Y CLP	Camera Y CLP level adjustment
R-Y CLP	Camera R-Y CLP level adjustment
B-Y CLP	Camera B-Y CLP level adjustment

• Page 7 Chroma/VF Adjustment

→PAGE7 (NEXT→▼ PREV→▲)	
R-Y C/B :	110
R-Y BST :	0
B-Y C/B :	110
B-Y BST :	75
VF SYNC :	170
VF BLKG :	135
VF Y :	0
EXIT MENU (YES→PUSH)	

R-Y C/B	Camera R-Y carrier balance adjustment
R-Y BST	Camera R-Y burst level adjustment
B-Y C/B	Camera B-Y carrier balance adjustment
B-Y BST	Camera B-Y burst level adjustment
VF SYNC	Viewfinder video sync level adjustment
VF BLKG	Viewfinder video blanking level adjustment
VF Y	Not in use

• Page 8 Chroma SC Adjustment

→PAGE8 (NEXT→▼ PREV→▲)

SC FREQ : 2550
SC-H : 450

EXIT MENU (YES→PUSH)

SC FREQ SC frequency adjustment
SC-H SC-H adjustment

• Page 9 VTR Output Adjustment 1

→PAGE9 (NEXT→▼ PREV→▲)

VTR Y : 130
VTR R-Y : 145
VTR B-Y : 145
R-Y DELAY : 128
B-Y DELAY : 128

EXIT MENU (YES→PUSH)

VTR Y VTR Y level adjustment
VTR R-Y VTR R-Y level adjustment
VTR B-Y VTR B-Y level adjustment
R-Y DELAY VTR R-Y phase adjustment
B-Y DELAY VTR B-Y phase adjustment

• Page 10 VTR Output Adjustment 2

→PAGE10 (NEXT→▼ PREV→▲)

EE S-Y : 155
EE S-C : 155
VTR BST : 125
VTR SYNC : 100
PB VBS : 170

EXIT MENU (YES→PUSH)

EE S-Y VTR EE S-Y level adjustment
EE S-C VTR EE S-C level adjustment
VTR BST VTR burst level adjustment
VTR SYNC VTR SYNC level adjustment
PB VBS PB picture VBS level adjustment

• **Page 11 Various Setting 1**
(For DSR-500WS)

→PAGE11 (NEXT→▼ PREV→▲)

COMP LEV : 525
READ OUT : FD

EXIT MENU (YES→PUSH)

		Standard Setting
SETUP	ON/OFF control of setup	OFF
READ OUT	FD (Field): CCD switches in Field read mode FM (Frame): CCD switches in Frame read mode	FD
V BLKG	Blanking width setting (19/20/21H)	20H
MAT DEST	Matrix destination setting (EBU/SMPTE) (Factory setting = EBU)	EBU

Note: In frame read out, higher vertical resolution can be obtained, however, image lag is increasing. If shutter function is on with frame read out, sensitivity drops in half against the normal.

(For DSR-500WSP)

→PAGE11 (NEXT→▼ PREV→▲)

COMP LEV : 525
READ OUT : FD

EXIT MENU (YES→PUSH)

		Standard Setting
COMP LEV	525/700 selection of color difference output (pin 26)	525
READ OUT	FD (Field): CCD switches in Field read mode FM (Frame): CCD switches in Frame read mode	FD

• **Page 12 TEST MODE**

→PAGE12 (NEXT→▼ PREV→▲)

TEST : OFF
R-Y : ON
B-Y : ON

EXIT MENU (YES→PUSH)

		Standard Setting
TEST	TEST OFF: TEST SAW	OFF
	TEST: 1 Displays 100 % TEST SAW.	
	TEST: 2 Displays 226 % TEST SAW.	
	TEST: 3 Displays 226 % TEST SAW in the lower side of screen.	
R-Y	ON/OFF control of R-Y output	ON
B-Y	ON/OFF control of B-Y output	ON

• **Page 13 HEAD BLOCK No. Information**

→PAGE13 (NEXT→▼ PREV→▲)

HEAD 1 : G
HEAD 2 : V
HEAD 3 : 0
HEAD 4 : 0
HEAD 5 : 0
HEAD 6 : 1
HEAD 7 : 6

EXIT MENU (YES→PUSH)

HEAD1 - 7 Block number

Be sure to input the block number which is shown on the side of CCD unit after the replacement of TG-204 board or the EEPROM (IC1) on the TG-204 board.

Input method: Turn the MENU dial and enter the letter or number.

• Page 14 Sub-Voltage Information

→PAGE14 (NEXT→▼ PREV→▲)		
R RG	:	90
G RG	:	90
B RG	:	90
R SUB	:	128
G SUB	:	128
B SUB	:	128
TPC	:	±0
EXIT MENU (YES→PUSH)		

R RG	R RG-voltage setting
G RG	G RG-voltage setting
B RG	B RG-voltage setting
R SUB	R channel sub-voltage setting
G SUB	G channel sub-voltage setting
B SUB	B channel sub-voltage setting
TPC	NR temperature compensation constant setting

Note: Values shown on the screen depend on each CCD unit. Never change the value.

• Page 15 Various Setting 2

→PAGE15 (NEXT→▼ PREV→▲)		
GAMMA	:	ON
MATRIX	:	ON
DETAIL	:	ON
APERTURE	:	ON
FLARE	:	ON
EXIT MENU (YES→PUSH)		

		Standard Setting
GAMMA	ON/OFF control of GAMMA	ON
MATRIX	ON/OFF control of MATRIX	ON
DETAIL	ON/OFF control of DETAIL	ON
APERTURE	ON/OFF control of APERTURE	ON
FLARE	ON/OFF control of FLARE correction	ON

• Page 16 TITLE Color Setting

→PAGE16 (NEXT→▼ PREV→▲)		
R TITLE	:	75
G TITLE	:	75
B TITLE	:	75
R EDGE	:	0
G EDGE	:	0
B EDGE	:	0
ABC123		
EXIT MENU (YES→PUSH)		

When displaying the title in the video signal, title color can be set manually. Besides, edge color of title character can be set manually.

		Standard Setting
R TITLE	Title's R level (0/25/50/75):	75
G TITLE	Title's G level (0/25/50/75):	75
B TITLE	Title's B level (0/25/50/75):	75
R EDGE	Title edge's R level (0/25/50/75):	0
G EDGE	Title edge's G level (0/25/50/75):	0
B EDGE	Title edge's B level (0/25/50/75):	0
ABC123	Indication for checking actual title color	

• Page 17 Various Setting 3

→PAGE17 (NEXT→▼ PREV→▲)		
M.GAMMA	:	132
R.GAMMA	:	± 0
B.GAMMA	:	± 0
M.BLACK	:	2083
EXIT MENU (YES→PUSH)		

		Standard Setting
M.GAMMA	Standard value setting of master GAMMA:	132
R.GAMMA	R channel's GAMMA offset setting:	±0
B.GAMMA	B channel's GAMMA offset setting:	±0
GAMMA TBL	Selection of GAMMA table A/B:	B
M.BLACK	Standard value setting of master black:	*2083
	* For DSR-500WS:	2083
	For DSR-500WSP:	2075

• Page 18 IRIS Related Setting

→PAGE18 (NEXT→▼ PREV→▲)
 WHT CLIP : 255
 IRIS GAIN : 128
 IRIS MODE : 100
 IRIS SET : 144
 LOW LIGHT : 152

 EXIT MENU (YES→PUSH)

		Standard Setting
WHT CLIP	Standard value setting of WHITE CLIP level	
IRIS GAIN	Setting of auto iris gain: Following speed of auto iris can be changed.	128
IRIS MODE	Setting of auto iris peak average ratio: Set the ratio of auto iris's peak and average values.	100
IRIS SET	Setting of the target value of auto iris:	144
LOW LIGHT	Setting of low light warning indication level: * For DSR-500WS: 152 For DSR-500WSP: 160	*152

• Page 19 Color Temperature Calculation Reference Setting

→PAGE19 (NEXT→▼ PREV→▲)
 COLOR TEMP CAL.
 (YES→PUSH)
 R : 128
 B : 128

 EXIT MENU (YES→PUSH)

COLOR TEMP CAL.	Writes the reference value of color temperature indication
R	The following write result of R channel's reference value: • Reference value setting • Color temperature indication
B	The following write result of B channel's reference value: • Reference value setting • Color temperature indication

Note: In COLOR TEMP CAL., it writes the color temperature calculation reference value during Auto White operation. Normally, it is not necessary to perform this adjustment. If the color temperature value, which is indicated on the screen, differs from an actual value, perform CCD OUT level adjustment and etc. and to rewrite the reference value as follows:

1. Shoot the pattern (color temperature = 3200 K).
2. Set the WHT BAL switch to A or B, and perform Auto White adjustment.
3. Move the cursor on the COLOR TEMP position and push the MENU dial.

• Page 20 FILTER Display Setting

→PAGE20 (NEXT→▼ PREV→▲)

FILTER1 : 3200/3000
 FILTER2 : 5600+1/8ND
 FILTER3 : 5600
 FILTER4 : 5600+1/64ND

EXIT MENU (YES→PUSH)

FILTER 1 to 4

Set the screen indication in accordance with a kind of filter attached.

Setting

1. Turn the MENU dial to move the cursor to FILTER No. on the screen.
2. Push the MENU dial.
3. Turn the MENU dial to display the indication to be set.

By turning the MENU dial, indication will be changed as follows:

3200/3000 ⇔ CROSS ⇔ 5600 ⇔ 5600 + 1/4ND ⇔ 5600 + 1/8ND ⇔ 5600 + 1/16ND ⇔ 5600 + 1/32ND ⇔ 5600 + 1/64ND

4. To set the indication, push the MENU dial.

• Page 21 Self Diagnosis 1

→PAGE21 (NEXT→▼ PREV→▲)

DIAG ERROR RESET
(YES→PUSH)

MEMORY BACKUP
(YES→PUSH)

EXIT MENU (YES→PUSH)

DIAG ERROR RESET

This item is used for erasing an error check results and a history of error items.

MEMORY BACKUP

This item is used when back up the EEPROMs data on the TG, DPR, and ES boards to EEPROM on the AT board. Backup is needed when the TG, DPR, or ES board has been replaced.

If there is a communication error between the TG, DPR, or ES board's EEPROM and microcomputer when the power is turned on, be sure to use the backed up data in EEPROM on the AT board.

TO BACK UP THE MEMORY

1. Turn the MENU dial to move the cursor to MEMORY BACKUP position.
2. Push the MENU dial.

Note: The "DIAG ERROR RESET" and "MEMORY BACKUP" will be carried out when the RESET in Page 1 is executed.

Refer to Section 4-5 Self Diagnosis for Page22 to 24.

• **Page 25 Current Status Display**

→PAGE25 (NEXT→▼ PREV→▲)
 POWER : 13.0V
 TIS : 250h
 R GAIN : 800h
 B GAIN : 800h
 IRIS POS : 800h
 KWC : 800h
 EXIT MENU (YES→PUSH)

Not in use

• **Page 26 TG ROM Operation**

→PAGE26 (NEXT→▼ PREV→▲)
 TG ROM
 EXIT MENU (YES→PUSH)

Not in use

• **Page 27 Carrier Adjustment When DPR (Dual Pixel Readout) is on.**

→PAGE27 (NEXT→▼ PREV→▲)
 R D.DARK : 128
 G D.DARK : 128
 B D.DARK : 128
 EXIT MENU (YES→PUSH)

R D.DARK	R Carrier balance adjustment
G D.DARK	G Carrier balance adjustment
B D.DARK	B Carrier balance adjustment

5-2-4. File Menu

• Page 1 All Reset (For DSR-500WS)

→ PAGE1 (NEXT→▼ PREV→▲)

ALL RESET
(YES→PUSH)
DEST : UC

EXIT MENU (YES→PUSH)

Each item value in all FILE can be restored to their standard setting (factory setting).

DEST Select the destination according to the unit in use.
The standard setting differs depending on the destination.
(Displays distination for NTSC only.)

This is the same contents with service menu "Page 1".

(For DSR-500WSP)

→ PAGE1 (NEXT→▼ PREV→▲)

ALL RESET
(YES→PUSH)

EXIT MENU (YES→PUSH)

• Page 2 File Name Change / File Reset

→ PAGE 2 (NEXT→▼ PREV→▲)

FILE NO. : 1
FILE NAME :
(STD
FILE RESET
(YES→PUSH)

EXIT MENU (YES→PUSH)

FILE NO.	File No. of operation item
FILE NAME	File name of operation item file
FILE RESET	Performing of FILE RESET

• Page 3 File Recall

→ PAGE3 (NEXT→▼ PREV→▲)

FILE RECALL
FILE : *HISAT
SELECT FILE
STD
CHG FILE
(YES→PUSH)

EXIT MENU (YES→PUSH)

FILE	File name which is recalled
SELECT FILE	Select file to be recalled
CHG FILE	Performing of FILE RECALL

• Page 4 File Basic Setting

→ PAGE4 (NEXT→▼ PREV→▲)

M.BLACK	:	±0
STRETCH	:	±0
M.GAMMA	:	±0
DTL LEV	:	±0
V DTL LEV	:	-10
DTL FREQ	:	M

EXIT MENU (YES→PUSH)

M.BLACK	Master black level setting
STRETCH	Black stretch level setting
M GAMMA	Master GAMMA level setting
DTL LEV	Detail level setting
V DTL LEV	V detail level setting
DTL FREQ	Detail center frequency setting

FILE DATA selected with FILE SW is displayed on the PAGE 4 to 11.
When data value changed, the data in the FILE DATA selected with FILE SW is also rewritten.
When FILE SW is switched while any of the PAGE 4 to 11 is displayed, the display changes in response to the FILE SW position.

• Page 5 File HUE Setting

→ PAGE5 (NEXT→▼ PREV→▲)

SAT	:	±0
HUE	:	±0
SKIN SAT	:	±0
SKIN HUE	:	±0

EXIT MENU (YES→PUSH)

SAT	Chroma setting
HUE	HUE setting
SKIN SAT	Chroma setting of SKIN AREA
SKIN HUE	HUE setting of SKIN AREA

• Page 6 File Knee / GAMMA Setting

→ PAGE6 (NEXT→▼ PREV→▲)

M.KNEE P	:	300
M.KNEE S	:	90
GAMMA TBL	:	B
COMB	:	OFF

EXIT MENU (YES→PUSH)

M.KNEE P	Standard value setting of master knee point
M.KNEE S	Standard value setting of master knee slope
GAMMA TBL	Selection of GAMMA table A/B
COMB	COMB Filter setting

• Page 7 File Matrix Center Value Setting

→ PAGE7 (NEXT→▼ PREV→▲)

R-G LEV	:	38
R-B LEV	:	10
G-R LEV	:	6
G-B LEV	:	15
B-R LEV	:	6
B-G LEV	:	7

EXIT MENU (YES→PUSH)

R-G LEV	R-G coefficient center value
R-B LEV	R-B coefficient center value
G-R LEV	G-R coefficient center value
G-B LEV	G-B coefficient center value
B-R LEV	B-R coefficient center value
B-G LEV	B-G coefficient center value

• Page 8 File Matrix Variable Width Setting

→ PAGE8 (NEXT→▼ PREV→▲)
 R-G WIDTH : 40
 R-B WIDTH : 20
 G-R WIDTH : 40
 G-B WIDTH : -40
 B-R WIDTH : -20
 B-G WIDTH : -20
 EXIT MENU (YES→PUSH)

R-G WIDTH	HUE variable width of R-G coefficient
R-B WIDTH	HUE variable width of R-B coefficient
G-R WIDTH	HUE variable width of G-R coefficient
G-B WIDTH	HUE variable width of G-B coefficient
B-R WIDTH	HUE variable width of B-R coefficient
B-G WIDTH	HUE variable width of B-G coefficient

• Page 9 File Core Related Setting

→ PAGE9 (NEXT→▼ PREV→▲)
 LEVEL DEP : 52
 V DTL LIM : 20
 CRISP : 6
 EXIT MENU (YES→PUSH)

LEVEL DEP	Standard value setting of level depend level
V DTL LIM	Standard value of V DTL LIM
CRISP	Standard value setting of CORE level

• Page 10 File Detail Related Setting

→ PAGE10 (NEXT→▼ PREV→▲)
 APERTURE : 145
 AFT DTL : 25
 KNEE APT : 48
 HIGH DTL : 63
 CCS LEV : 5
 EXIT MENU (YES→PUSH)

APERTURE	Standard value setting of Aperture level
AFT DTL	Standard value of After GAMMA DTL gain
KNEE APT	Standard value of knee APT gain
HIGH DTL	Standard value of high light DTL gain
CCS LEV	Standard value of cross color supress level

• Page 11 File Stretch Setting

→ PAGE11 (NEXT→▼ PREV→▲)
 STRP1 : 20
 STRP2 : 45
 PRSP1 : 8
 PRSP2 : 63
 EXIT MENU (YES→PUSH)

STRP1	Standard value of BLACK STRETCH POINT1
STRP2	Standard value of BLACK STRETCH POINT2
PRSP1	Standard value of BLACK COMPRESS POINT1
PRSP2	Standard value of BLACK COMPRESS POINT2

• **Page 12 File Store**

→ PAGE12 (NEXT→▼ PREV→▲)

FILE STORE
FILE:*HISAT
DISTINATION FILE
USER1
STORE FILE
(YES→PUSH)

EXIT MENU (YES→PUSH)

FILE

DESTINATION FILE

STORE FILE

File name which is recalled

Selection of FILE STORE

Performing of FILE STORE

SECTION 6

PERIODIC MAINTENANCE AND INSPECTION

6-1. MAINTENANCE TIME TABLE

The times in the tables, indicating when parts are to be replaced, are not time guarantee for parts. Use these times as references for drawing up maintenance and inspection schedules for extending the life of the unit and tape use.

The time to replace parts differs according to the environments and conditions in which the unit is being used.

☆ : Replace ◇ : Check (Adjustment) ○ : Clean

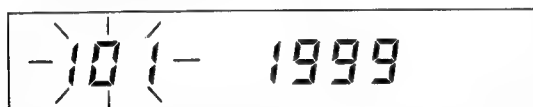
Maintenance Parts			Hours Meter	Maintenance Time (H)			
Item	Part No.	Name	Display Mode	1500	3000	4500	6000
Drum Assembly	A-7044-005-	DEH-03A-R	A	☆	☆	☆	☆
Drive Block							
LD Motor	A-8311-086-	LD Motor Block Assembly	A	◇	◇	◇	◇
Reel Motor	A-8311-088-	Shift Motor Assembly	A	—	◇	—	◇
Tension Regulator Band	X-3678-777-	TR Band Assembly	A	☆	☆	☆	☆
T Sub Reel	X-3678-885-	Sub Reel Gear (T) Assembly	A	☆	☆	☆	☆
S Sub Reel	X-3678-886-	Sub Reel Gear (S) Assembly	A	☆	☆	☆	☆
Idler Gear	X-3678-884-	Idler Gear Assembly	A	—	☆	—	☆
Capstan Motor	B-835-530-	DC Motor (SCD12A/J-N)	A	—	◇	—	◇
Brake Block							
T Hard Brake	A-8278-432-	Hard Brake Arm (T) Assembly	A	☆	☆	☆	☆
S Hard Brake	A-8278-433-	Hard Brake Arm (S) Assembly	A	☆	☆	☆	☆
T Soft Brake	X-3678-869-	Soft Brake Arm (T) Assembly	A	☆	☆	☆	☆
TL Soft Brake	X-3678-870-	Soft Brake (TL) Assembly	A	☆	☆	☆	☆
Tape Path Block							
Pinch Roller	X-3678-788-	Pinch Arm Assembly	A	☆	☆	☆	☆
Guide Roller TG-1, TG-8	3-604-702-	Roller TG-18	A	◇	◇	◇	◇
Guide Roller TG-2	A-8278-429-	TR Arm Assembly	A	◇	◇	◇	◇
Guide Roller TG-3	3-604-717-	Roller TG-3	A	◇	◇	◇	◇
Guide Roller TG-5	X-3748-626-	TG-5 Assembly	A	◇	◇	◇	◇
Guide Roller TG-7	3-748-777-	Roller TG-7	A	◇	◇	◇	◇
Tape Path	—	—	—	○	○	○	○
Clenner							
Cleaning Roller	A-8311-505-	C Assembly	A	☆	☆	☆	☆
Others							
Cassette Memory Terminal	A-8311-396-	MIC Holder (C) Assembly	A	◇○	◇○	◇○	◇○

HOURS METER MODE A: DRUM RUNNING

6-2. HOURS METER

An hours meter is provided in the MENU mode. The total operating time of the unit, total rotation time of the drum, and total running time of the tape are displayed on the window at the side. It is recommended that this hours meter be used as a reference for carrying maintenance. Display the hours meter using the following method.

1. When the MENU switch on the side is pressed, the following will be displayed.
<Display Example>



2. When the ADVANCE switch is pressed once, the following will be displayed.
<Display Example>

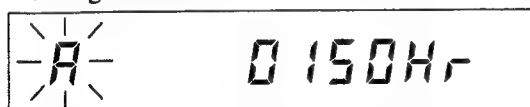


3. Each time the SHIFT switch is pressed, the display will change as follows.

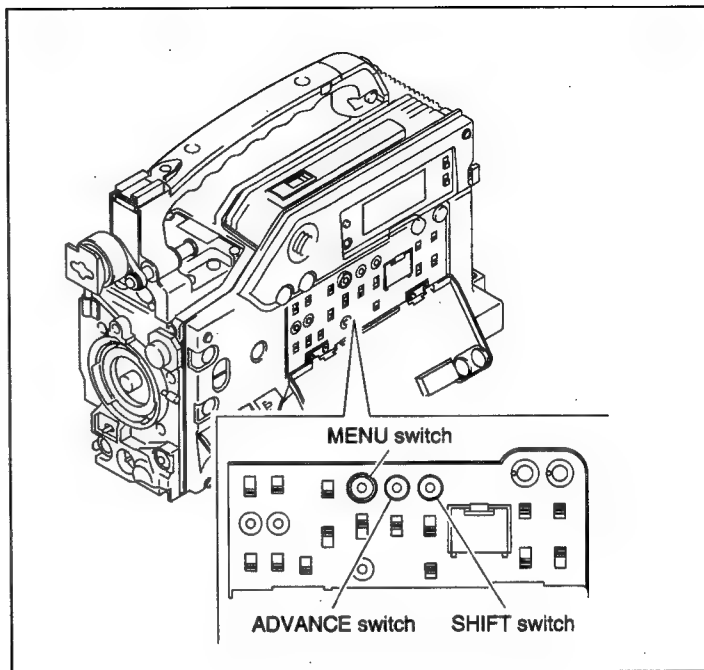
A : DRUM RUNNING METER
↓
B : TAPE RUNNING METER
↓
C : OPERATION METER
↓
201 : DRUM RUNNING METER

<Display Example: A>

This means that the total time the drum is rotating is 150H.



4. To end the MENU mode, press the MENU switch again.



6-3. MAINTENANCE AFTER REPAIRS

After repairing the unit, carry out the following maintenance regardless of how long the unit has been used.

- Cleaning of video head
- Cleaning of tape path

6-4. CLEANING METHOD

To perform cleaning, remove the cover of the cassette up compartment cover. (Refer to 7-2.

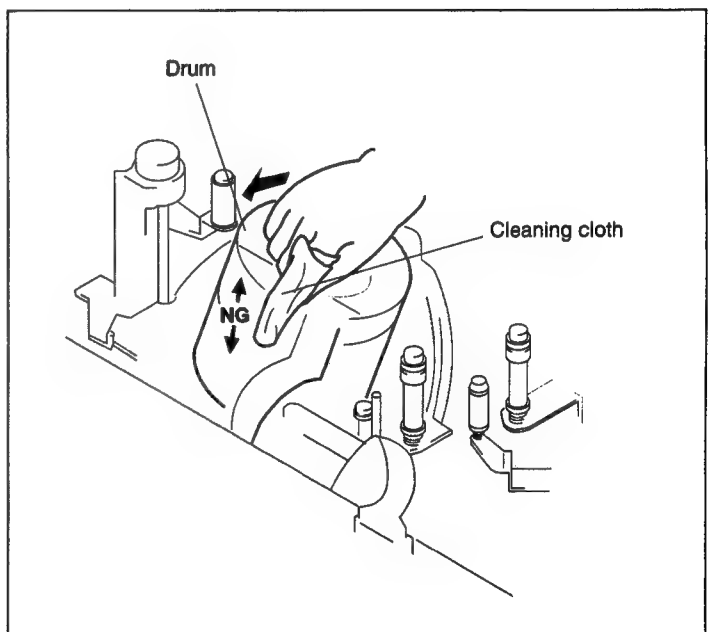
Replacement of Cassette Compartment Assembly.)

When loading cassette tapes after cleaning, wait for the cleaning liquid to evaporate completely.

(1) Cleaning the Rotary Drum Assembly

Using a cleaning cloth moistened with cleaning liquid, gently touch the cloth on the rotary drum assembly. Rotate the rotary upper drum slowly in the counterclockwise direction with your fingers to clean.

Note: Do not rotate the motor with the power turned ON nor rotate it in the clockwise direction with your fingers. Do not move the cleaning cloth over the head chip in the vertical direction, as this may damage the head chip. Never clean the head in this way.

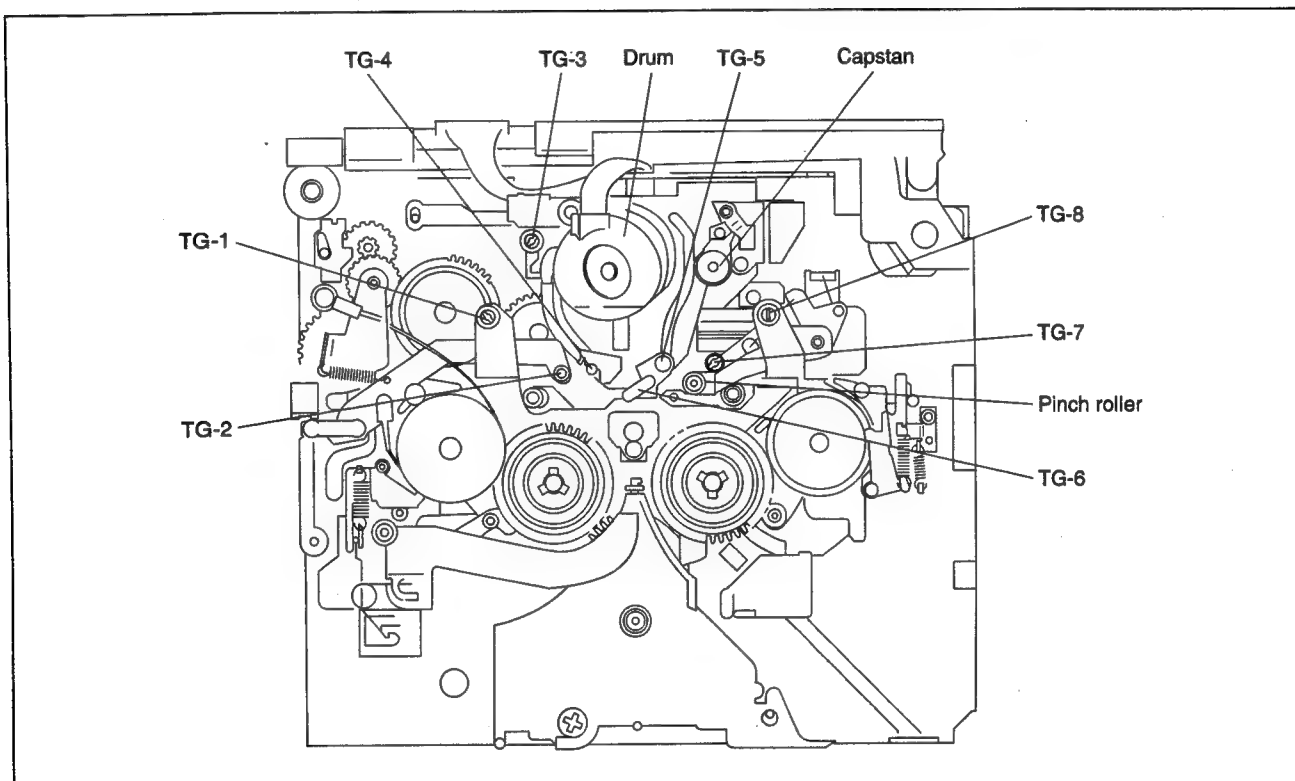


(2) Cleaning the Tape Path

Set the threading end state, and clean the tape path (TG-1, 2, 3, 4, 5, 6, 7, 8, capstan, pinch roller) and lower drum with a stick moistened with cleaning liquid.

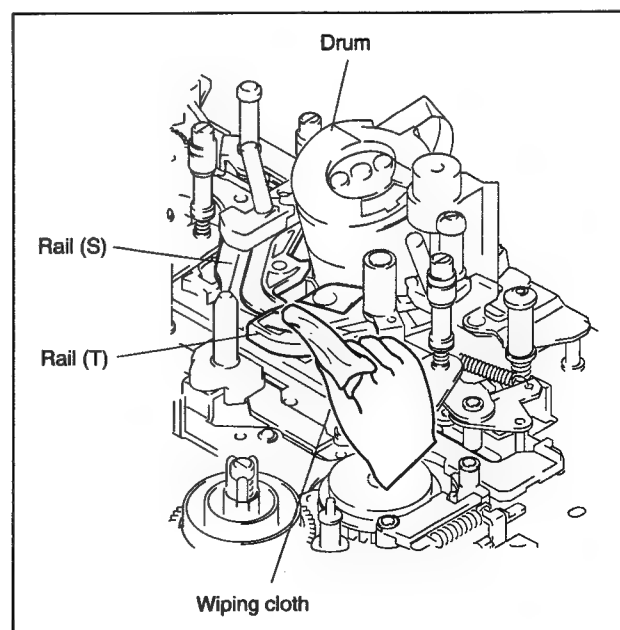
Note 1: Make sure the oil and grease on the linked mechanisms do not adhere to the stick.

Note 2: Do not use a stick moistened with alcohol for cleaning other guides. However clean the pinch roller with alcohol.



(3) Cleaning the Rail

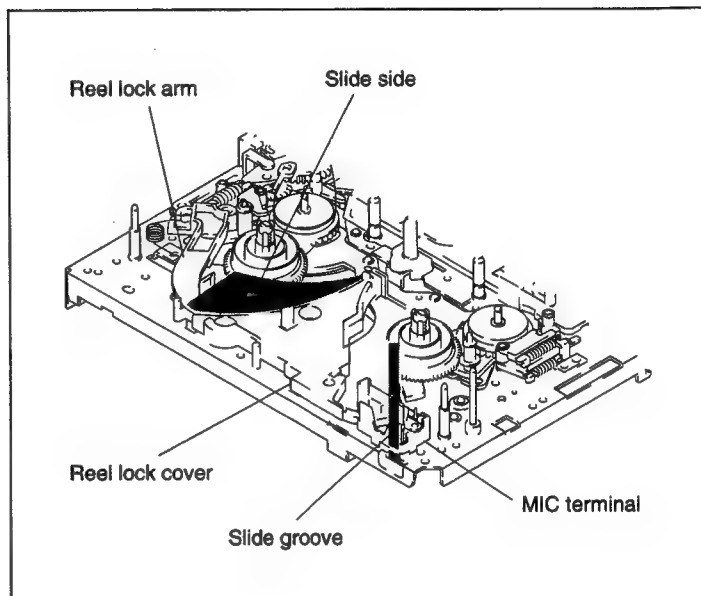
Wipe with a cloth moistened with alcohol.



6-5. AFTER USE IN COASTAL AREAS AND DUSTY AREAS

After use in coastal and dusty areas, it is recommended that the following be checked.

1. Wipe away sand and dusts in the unit with a cleaning cloth moistened with cleaning liquid, or remove carefully with an air brush, etc.
2. Clean the video head with a cleaning cloth moistened with cleaning liquid.
3. Clean the tape path (drum surface, tape guide, capstan shaft, pinch roller, etc.)
4. Clean the groove for sliding the MIC terminal on the chassis and the side of the reel lock cover for sliding the reel lock arm. (See the figure.)
5. Clean the side touching the break shoe of the reel table.
6. Rotate the rotating body of the tape guide, pulley, capstan, and pinch roller, and check that no abnormal noise is produced.
Replace the parts if an abnormal noise appears.
7. After use in coastal areas, remove the printed wiring board from the unit, and remove the sand in the component side completely with an air brush. Then clean with a cleaning cloth moistened with cleaning liquid.
After this, clean the soldering side adequately with a wiping cloth moistened with cleaning liquid.
8. Clean the connector pin of the connector panel thoroughly.
9. Perform general checks and check that there are no abnormalities.



SECTION 7

REPLACEMENT/ALIGNMENT OF MAJOR PARTS

7-1. GENERAL INFORMATION ON REPLACEMENT/ALIGNMENT OF PARTS

1. Cassette compartment

When replacing parts and adjusting mechanism parts, unless specified otherwise, remove the cassette compartment from the unit.

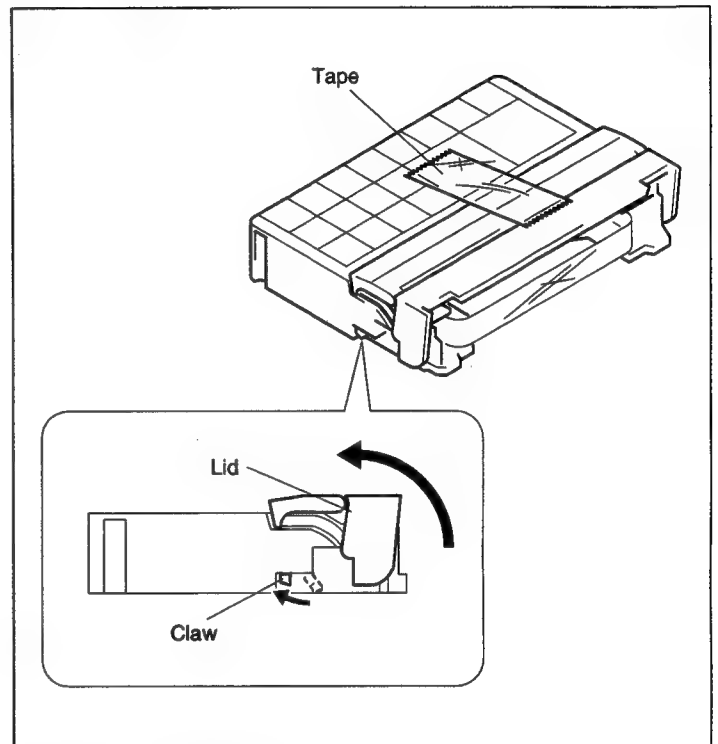
Details on how to replace the cassette compartment are provided in Section 7-2.

When setting the tape running state without the cassette compartment, open the cassette lid, and secure the lid with a tape, etc.

Mini cassette

- Move the claw (one) as shown in the figure, and open the lid.

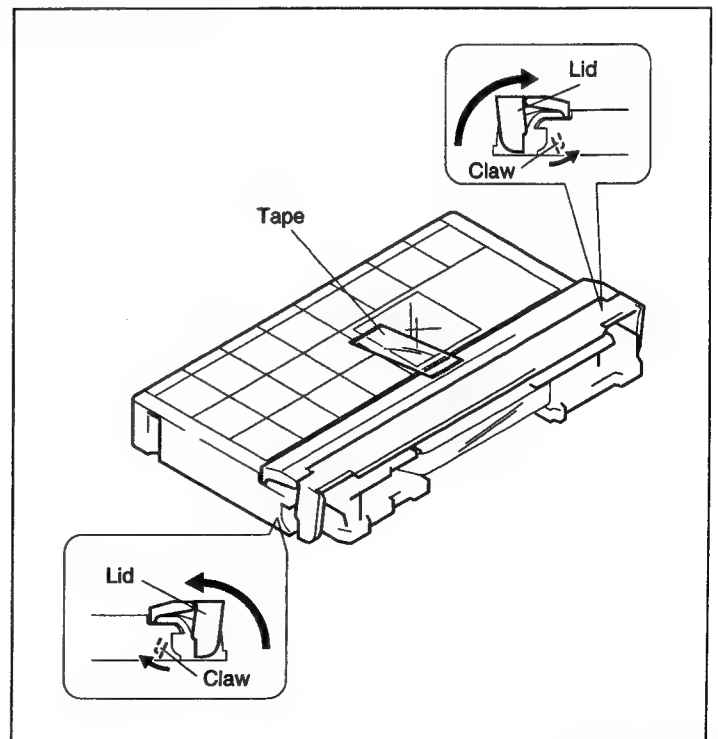
Mini cassette



Standard cassette

- Move the claws (two) as shown in the figure, and open the lid.

Standard cassette



2. Mode

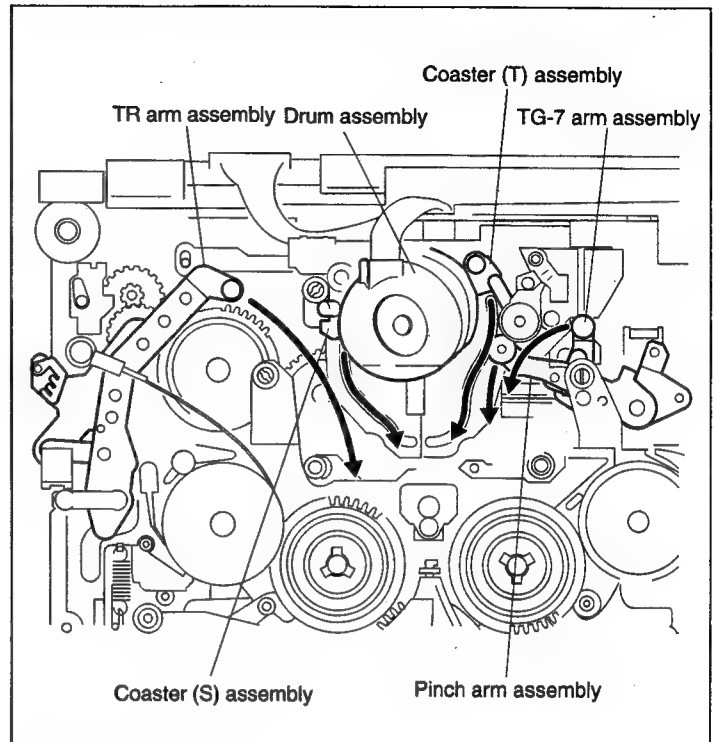
The TR arm assembly, coaster (S/T) assembly, pinch arm assembly and TG-7 arm assembly move and become in either threading end or unthreading end state.

In the above state, they can stay in any position unless the mode has been specified on the following pages.

Threading end:

The TR arm assembly, coaster (S/T) assembly, and pinch arm assembly, and TG-7 arm assembly are positioned at the drum side as shown in the figure.

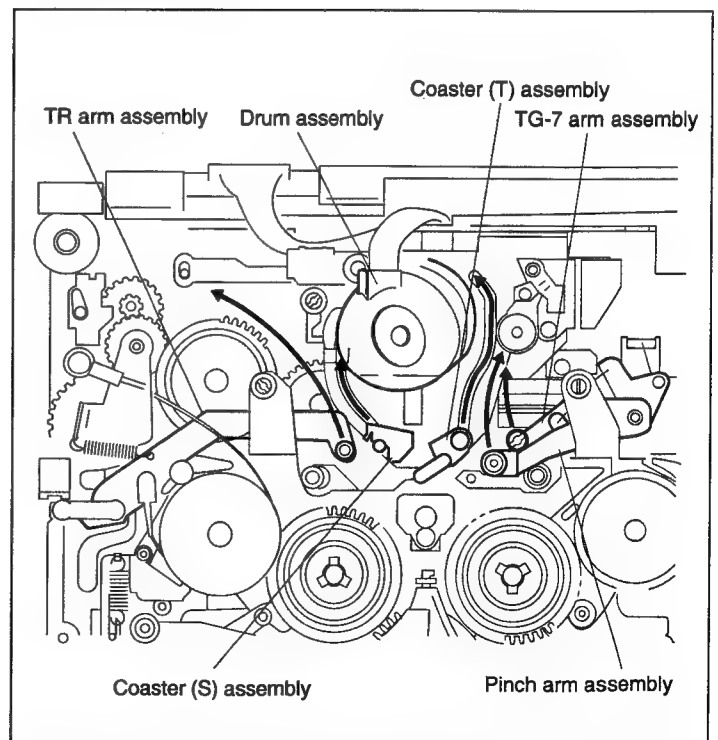
Threading End



Unthreading end:

The TR arm assembly, coaster (S/T) assembly, pinch arm assembly, and TG-7 arm assembly are positioned at the cassette side.

Unthreading End



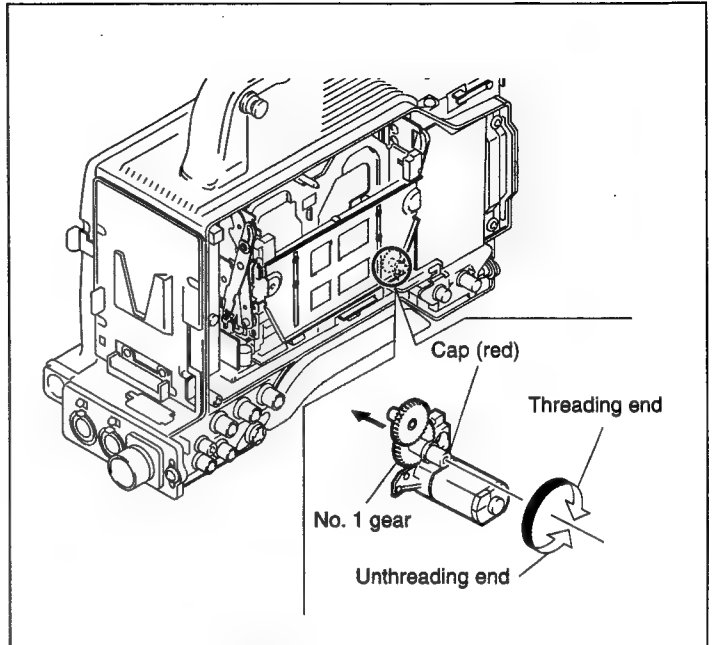
1) Setting manually

- Open the left panel assy. (Refer to Section 3-2-1.)
- Rotate the cap and No. 1 gear shown in the figure in the arrow direction while pressing it down to set the threading end/unthreading end.

2) Setting with the menu

Select Menu No. 613, and set the function cam mode.

- Threading is carried out while the STOP button is pressed.
- Unthreading is carried out while the EJECT button is pressed.



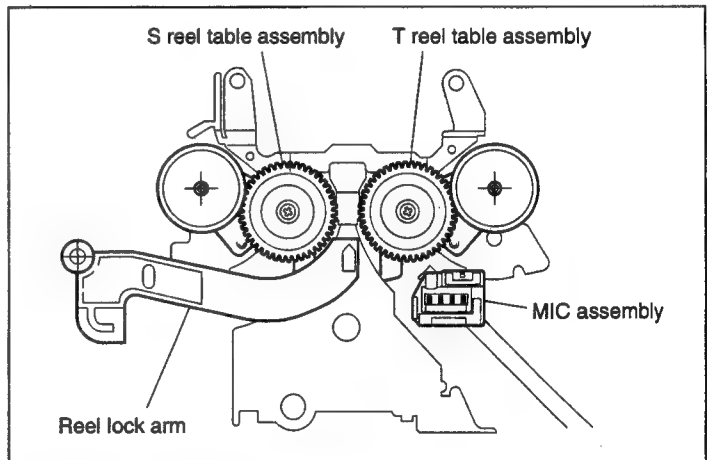
3. Reel Table Position

It is set to the mini cassette position/standard cassette position according to the position of the S reel table assembly/T reel table assembly.

Mini cassette position:

The reel lock arm, S reel table assembly/T reel table assembly, and MIC assembly are positioned at the drum side as shown in the figure.

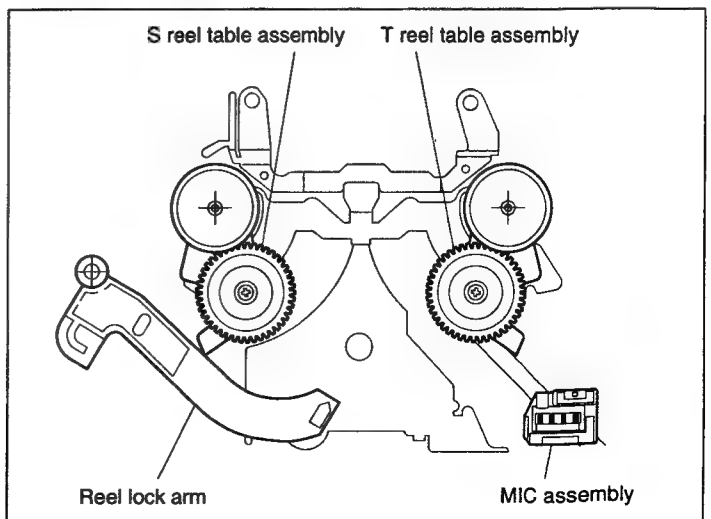
Mini cassette position



Standard cassette position:

The reel lock arm, S reel table assembly/T reel table assembly, and MIC assembly are positioned at the inserting side of the cassette as shown in the figure.

Standard cassette position



1) Setting manually

- Open the right panel assy.
(Refer to Section 3-2-2.)
- Remove the ES-21 board and DPR-141 board.
- Move up the cassette compartment.
(Refer to Section 4-1.)
- Rotate the gear of the shift motor shown in the figure in the arrow direction, to set the mini cassette position/standard cassette position.

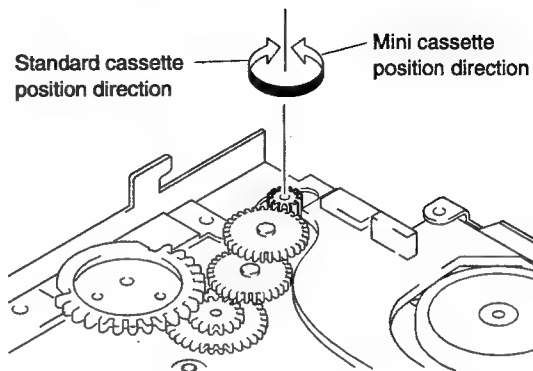
2) Setting with the switch

- Set the mode to the unthreading end.
- Move up the cassette compartment.
- Disconnect the connector (CN1) of the CC-68 board.
- Turn ON the power.
- Press the switch on the MT-114 board on the reel shift motor to move to the mini cassette position/standard cassette position.

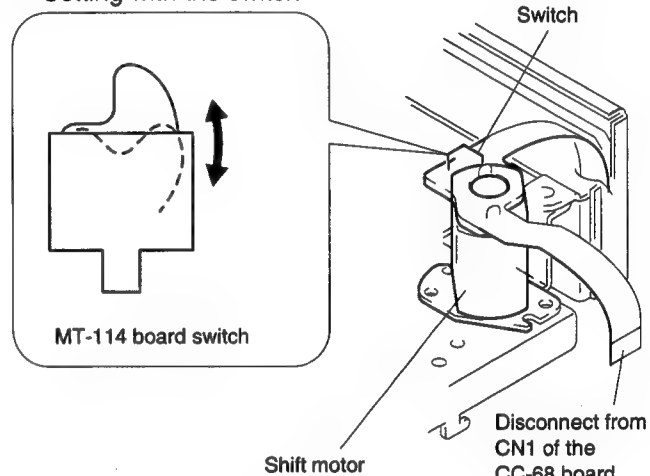
4. Do not use the stopper washers that secure parts once they have been removed for attaching new parts. After replacing parts, always use new stopper washers.

To attach stopper washers, push in until the space between the attached part and stopper washer is 0.1 to 0.2 mm.

Setting manually



Setting with the switch



7-2. REPLACEMENT OF CASSETTE COMPARTMENT ASSEMBLY

Reel table position: Mini cassette position

Mode: Unthreading end

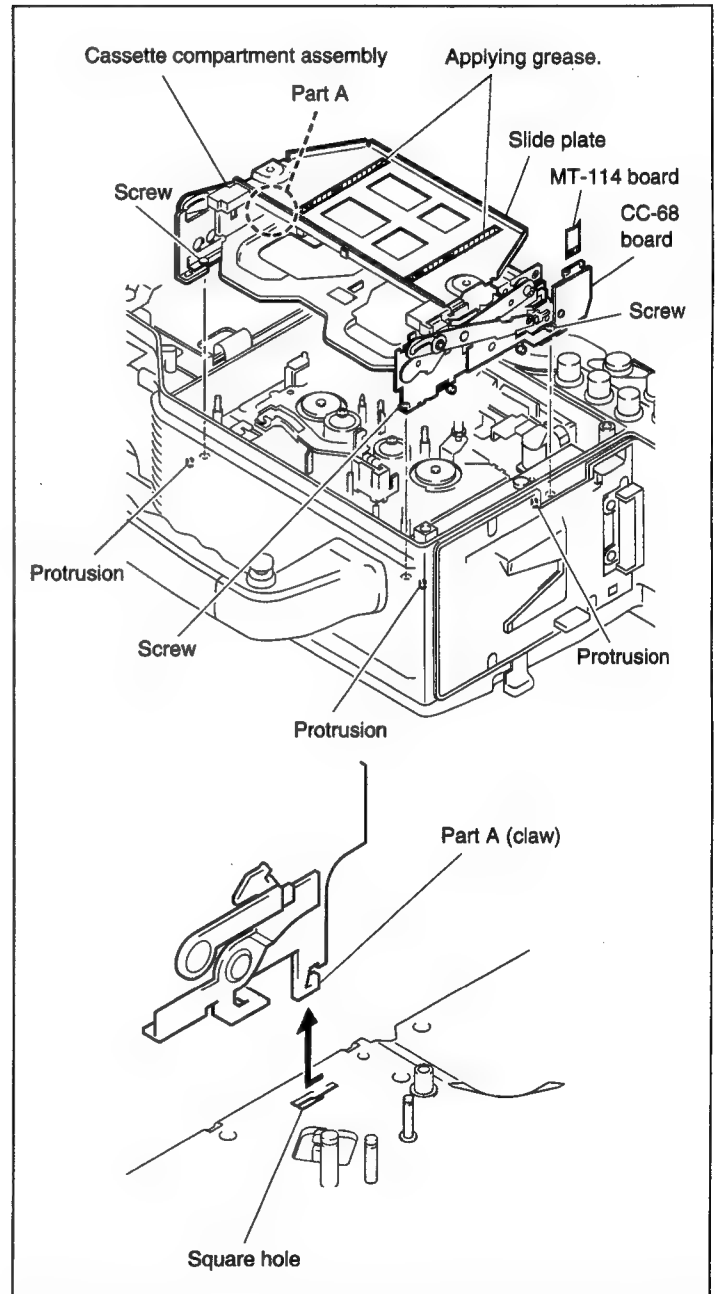
Removal

1. Eject and turn the cassette compartment assembly up.
2. Pull out the MT-114 board on the reel shift motor shown in the figure from the CC-68 board.
3. Loosen the three screws, remove part A from the square hole, and remove the cassette compartment assembly.

Attachment

4. Apply a small quantity of the grease SGL-801 (7-651-000-11) to the two square holes (shown with oblique lines in the figure) on the slide plate, then apply it in all square holes entirely.
5. Attach the new cassette compartment assembly and removed parts in the reverse order of steps 1 to 3.

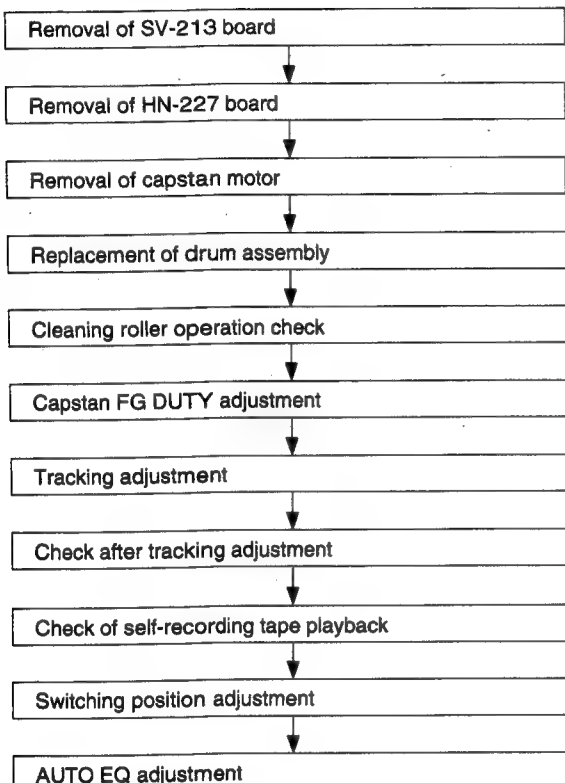
Note: Adjust the cassette compartment assembly to the three protrusion on the mechanism chassis first before securing the screws.



7-3. REPLACEMENT OF DRUM ASSEMBLY

Reel table position: Standard cassette position
Mode: Unthreading end

Replacement Flowchart



Removal

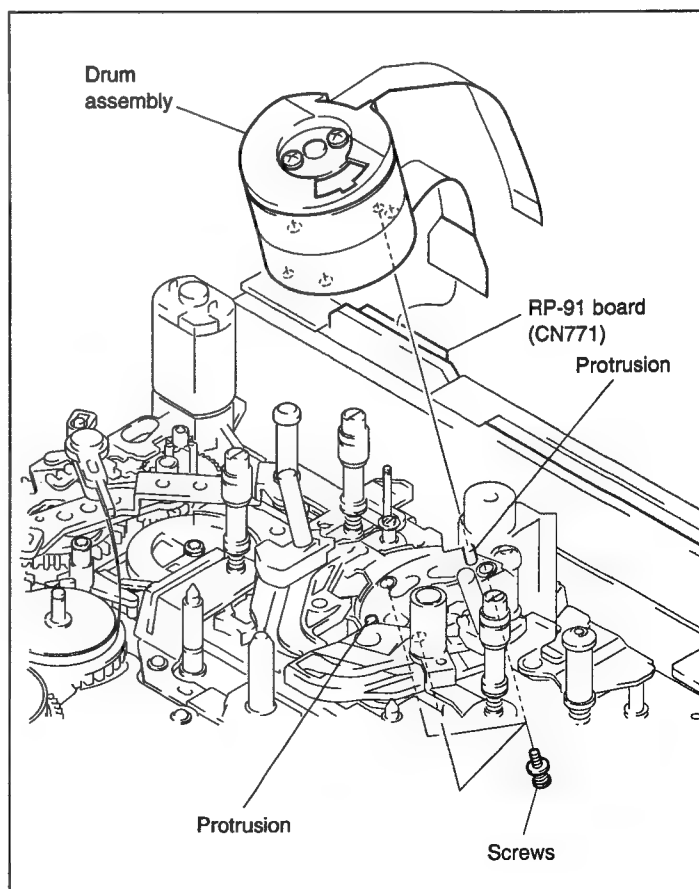
1. Remove the SV-213 board. (Refer to 3-9-8.)
2. Remove the HN-227 board. (Refer to 3-9-9.)
3. Remove the capstan motor. (Refer to 7-28.)
4. Disconnect the harness shown in the figure from the connector (CN771) of the RP-91 board.
5. Remove the three screws and remove the drum assembly.

Attachment

6. Adjust the holes of the new drum assembly to the two protrusions shown in the figure, and attach using three screws.
 - Tightening torque: 0.0294 N·m (0.3 kg·cm)
- Note:** When attaching, do not touch the tape path side of the drum to prevent it from scratching and becoming dirty.
7. Attach the removed parts in the reverse order of steps 1 to 4.

Check/Adjustment

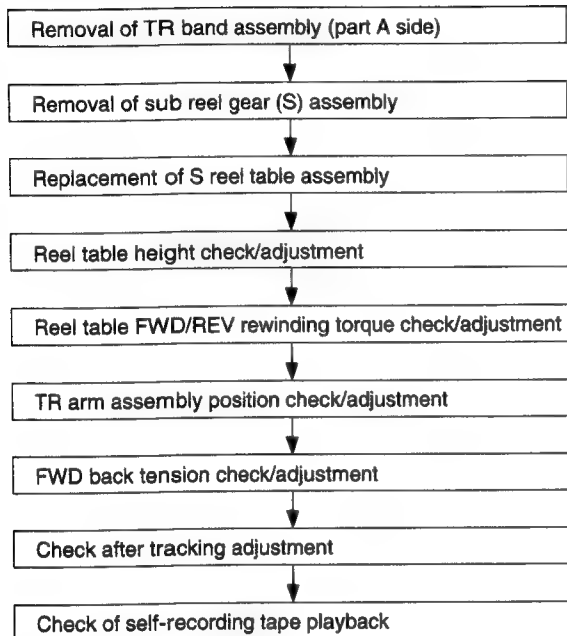
8. Perform the cleaning roller operation check. (Refer to step 3 in the Section 7-21.)
9. Perform the capstan FG DUTY adjustment at the Menu M601. (Refer to Section 11-2-1.)
10. Perform the tracking adjustment. (Refer to Section 8-3.)
11. Perform the check after tracking adjustment. (Refer to Section 8-4.)
12. Perform the check of self-recording tape playback. (Refer to Section 8-5.)
13. Perform the switching position adjustment at Menu M605. (Refer to Section 8-6.)
14. Perform the AUTO EQ adjustment at the Menu M704. (Refer to Section 11-3.)



7-4. REPLACEMENT OF S REEL TABLE ASSEMBLY

Reel table position: Standard cassette position

Replacement Flowchart



Removal

1. Remove the TR band assembly (part A side) shown in the figure.
2. Remove the sub reel gear (S) assembly. (Refer to Section 7-10.)
3. Remove the washer shown in the figure, and remove the reel lock driving arm.

Replacement/Attachment

4. Remove the S side reel table assembly, and replace with a new reel table assembly.
5. Attach the removed parts in the reverse order of steps 1 to 3.
6. Rotate the S reel table assembly with your hand, and check that it rotates smoothly.

Check/Adjustment

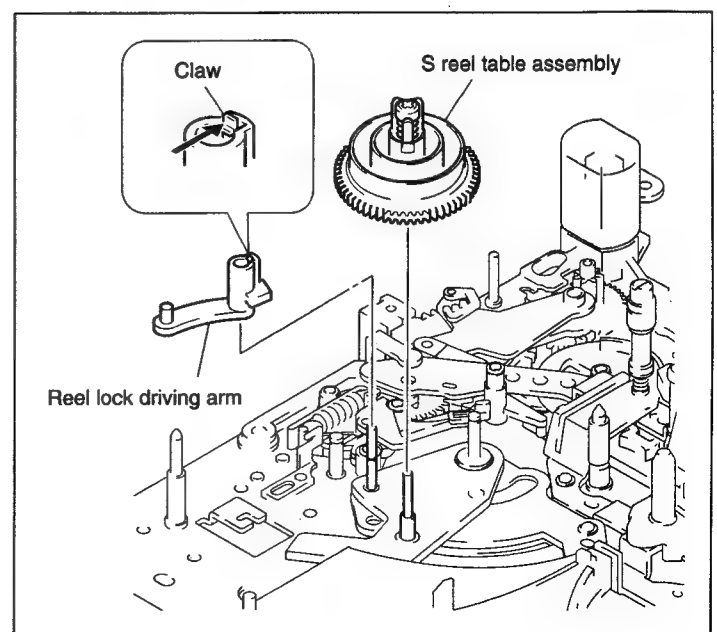
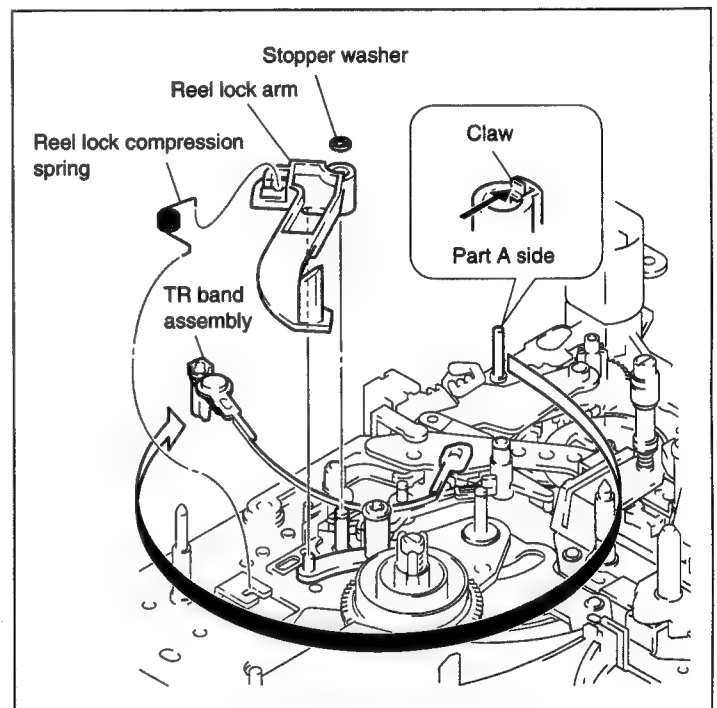
7. Perform reel table height check/adjustment. (Refer to Section 7-36.)
8. Perform reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)
9. Perform TR arm assembly position check/adjustment. (Refer to Section 7-40.)
10. Perform FWD back tension check/adjustment. (Refer to Section 7-39.)

11. Perform the check after tracking adjustment.

(Refer to Section 8-4.)

12. Perform the check of self-recording tape playback.

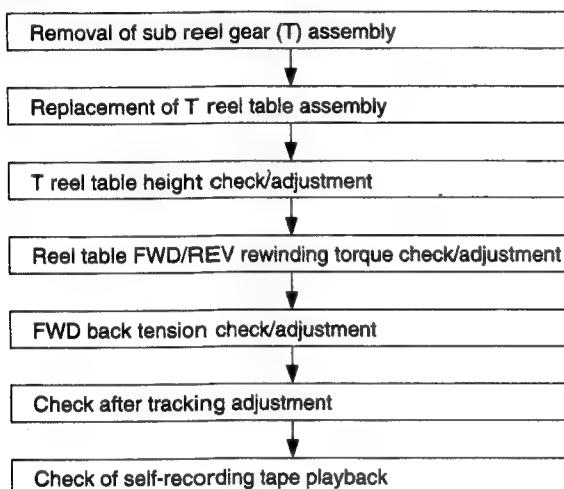
(Refer to Section 8-5.)



7-5. REPLACEMENT OF T REEL TABLE ASSEMBLY

Reel table position: Standard cassette position

Replacement Flowchart



Removal

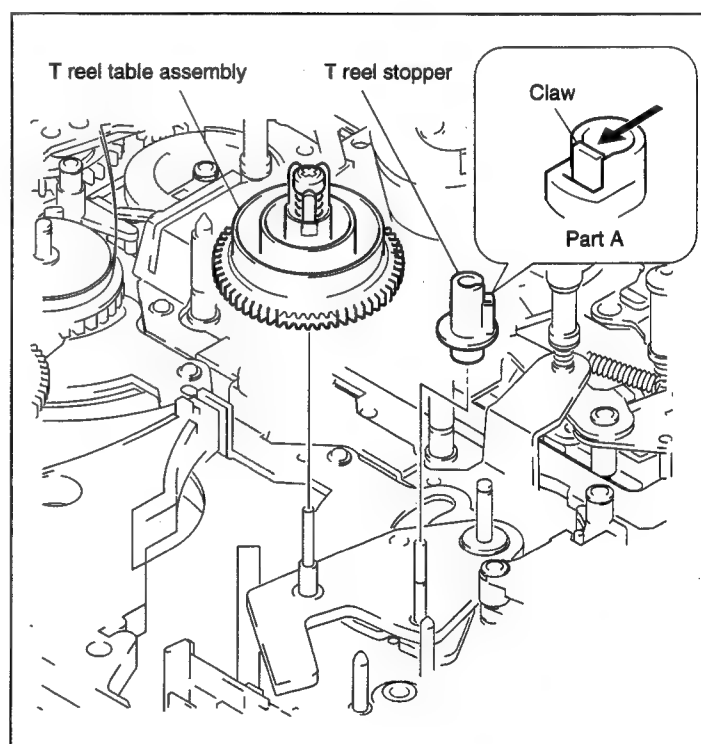
1. Remove the sub reel gear (T) assembly.
(Refer to Section 7-11.)
2. While pressing the claw at part A shown in the figure in the arrow direction, remove the T reel stopper upwards.

Replacement/Attachment

3. Remove the T side reel table assembly, and replace with a new reel table assembly.
4. Attach the removed parts in the reverse order of steps 1 and 2.
5. Rotate the T reel table assembly with your hand, and check that it rotates smoothly.

Check/Adjustment

6. Perform reel table height check/adjustment.
(Refer to Section 7-36.)
7. Perform reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)
8. Perform FWD back tension check/adjustment.
(Refer to Section 7-39.)
9. Perform the check after tracking adjustment.
(Refer to Section 8-4.)
10. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



7-6. REPLACEMENT OF SOFT BRAKE ARM (S)

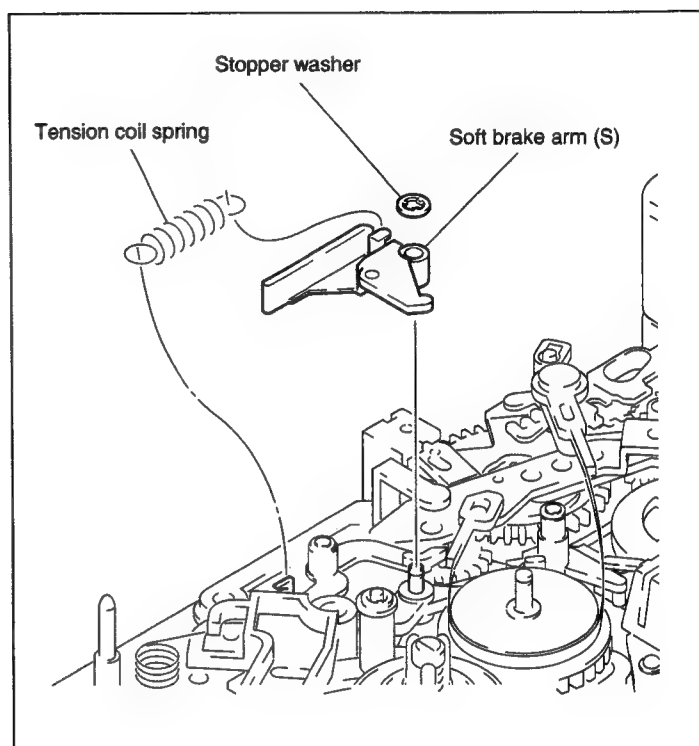
Mode: Unthreading end

Removal

1. Remove the tension coil spring shown in the figure.
2. Remove the stopper washer, and remove the soft brake arm (S).

Attachment

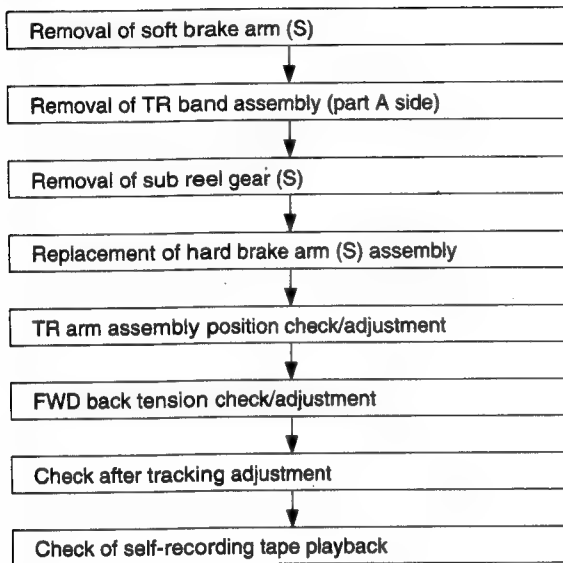
3. Attach a new soft brake arm (S) in the reverse order of step 2.
4. Attach the tension coil spring of step 1.



7-7. REPLACEMENT OF HARD BRAKE ARM (S) ASSEMBLY

Mode: Unthreading end

Replacement Flowchart



Removal

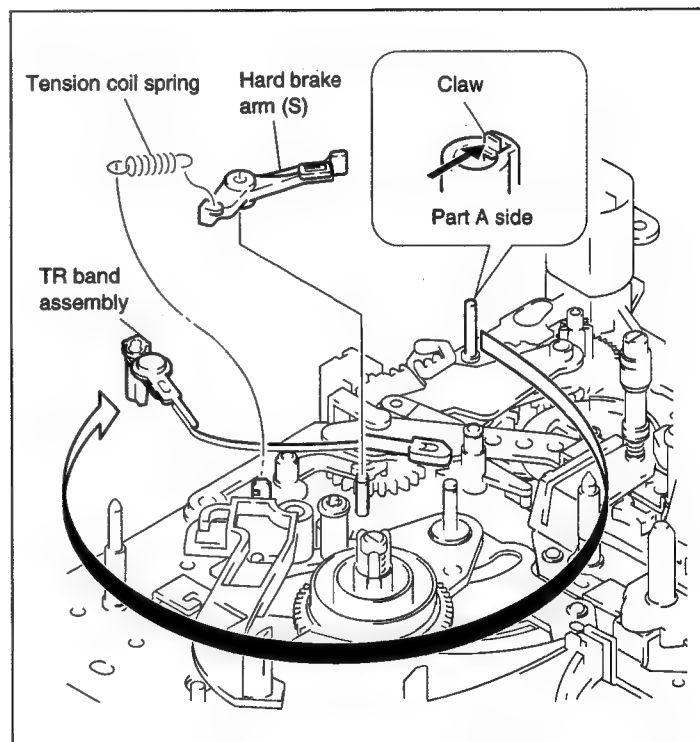
1. Remove the soft brake arm (S).
(Refer to Section 7-6.)
2. Remove the TR band assembly (part A side).
3. Remove the sub reel gear (S) assembly.
(Refer to Section 7-10.)
4. Remove the tension coil spring shown in the figure.
5. Remove the hard brake arm (S) assembly.

Attachment

6. Remove a new hard brake arm (S) assembly.
7. Attach the removed parts in the reverse order of steps 1 to 4.

Check/Adjustment

8. Perform TR arm assembly position check/adjustment. (Refer to Section 7-40.)
9. Perform FWD back tension check/adjustment. (Refer to Section 7-39.)
10. Perform the check after tracking adjustment. (Refer to Section 8-4.)
11. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



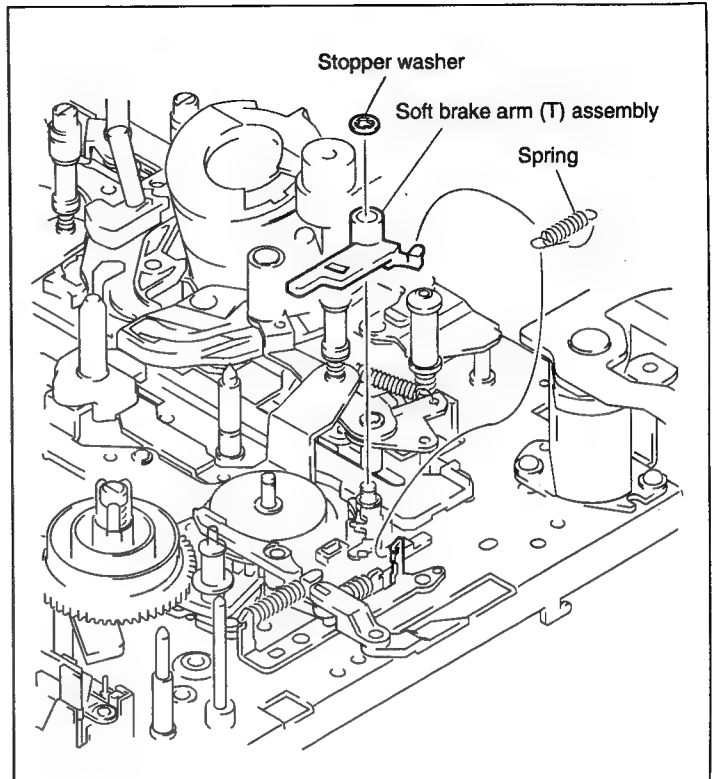
7-8. REPLACEMENT OF SOFT BRAKE (T) ASSEMBLY COMPONENTS

7-8-1. Replacement of Soft Brake Arm (T) Assembly

Reel table position: Standard cassette position
Mode: Unthreading end

Removal/Attachment

1. Remove the spring shown in the figure.
2. Remove the stopper washer and remove the soft brake arm (T) assembly.
3. Attach the soft brake arm (T) assembly in the reverse order of steps 1 and 2.

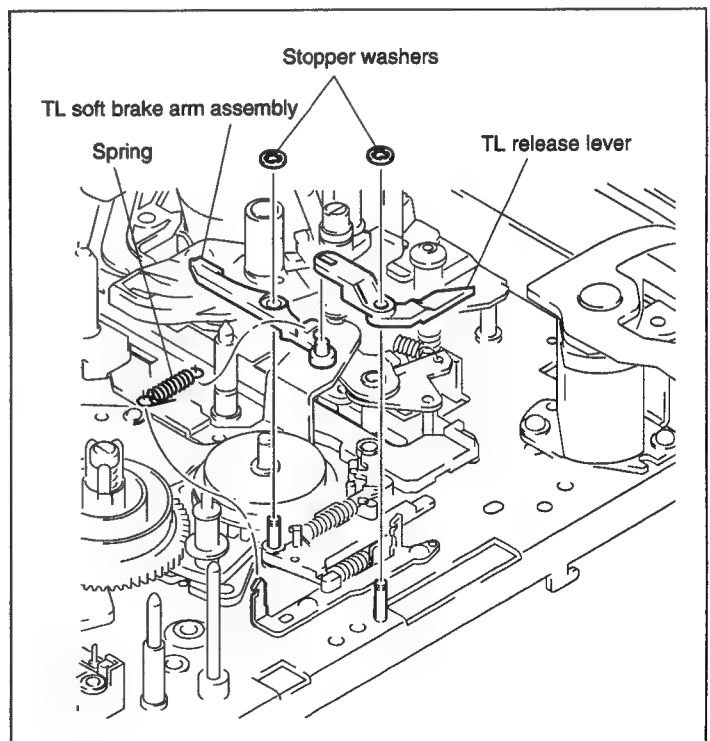


7-8-2. Replacement of TL Soft Brake Assembly

Reel table position: Standard cassette position
Mode: Unthreading end

Removal/Attachment

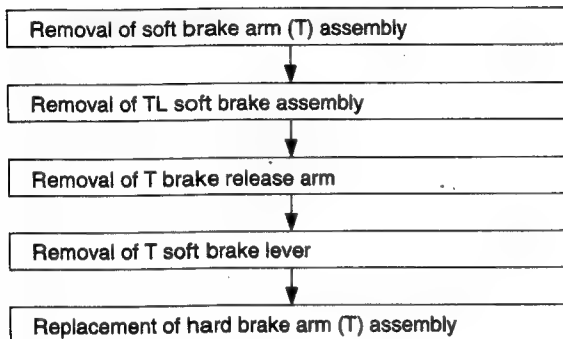
1. Remove the spring shown in the figure.
2. Remove the two stopper washers and remove the TL release lever and TL soft brake assembly.
3. Attach the soft brake arm (T) assembly in the reverse order of steps 1 and 2.



7-9. REPLACEMENT OF HARD BRAKE ARM (T) ASSEMBLY

Mode: Unthreading end

Replacement Flowchart

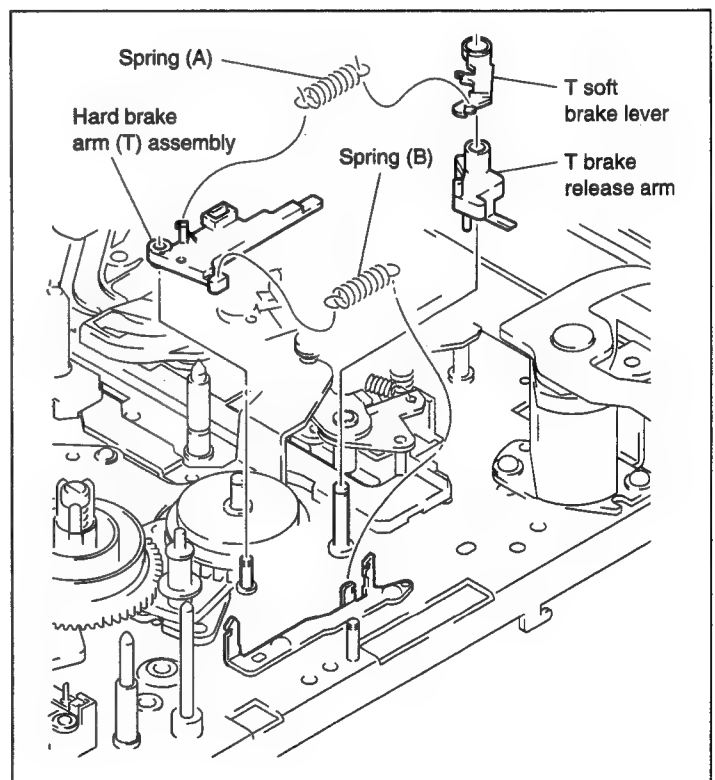


Removal

1. Remove the soft brake arm (T) assembly.
(Refer to Section 7-8-1.)
2. Remove the TL soft brake assembly.
(Refer to Section 7-8-2.)
3. Remove spring (A) and then remove the T soft brake lever.
4. Remove the T brake release arm.
5. Remove the spring (B) shown in the figure, and remove the hard brake arm (T) assembly.

Attachment

6. Attach a new hard brake arm (T) assembly.
7. Attach the removed parts in the reverse order of steps 1 to 4.

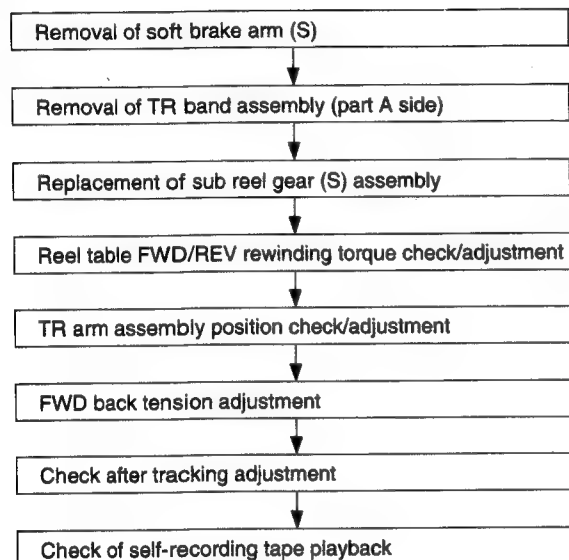


7-10. REPLACEMENT OF SUB REEL GEAR (S) ASSEMBLY

Reel table position: Standard cassette position

Mode: Unthreading end

Replacement Flowchart



Removal

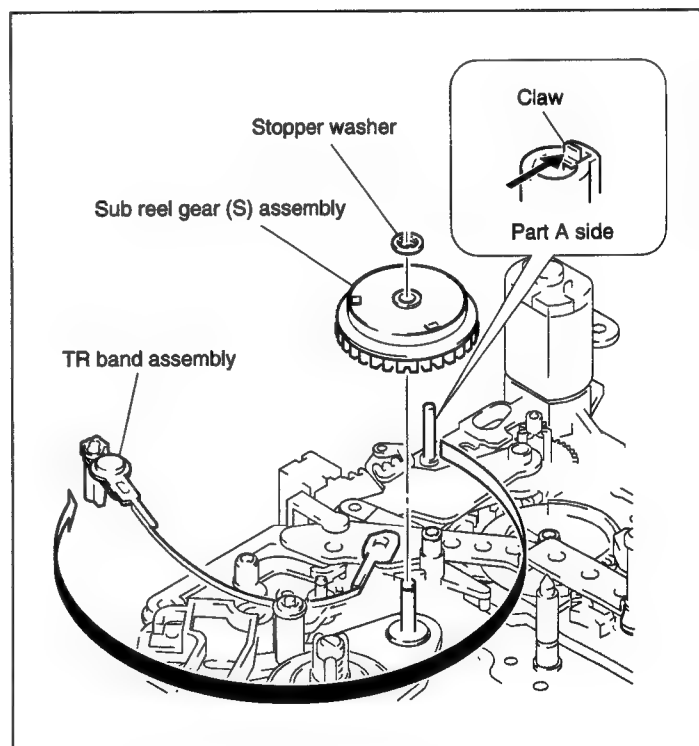
1. Remove the soft brake arm (S).
(Refer to Section 7-6.)
2. Remove the TR band assembly (part A side).
3. Remove the stopper washer shown in the figure, and remove the sub reel gear (S) assembly.

Attachment

4. Attach the new sub reel gear (S) assembly.
5. Attach the removed parts in the reverse order of steps 1 and 2.

Check/Adjustment

6. Perform reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)
7. Perform TR arm assembly position check/adjustment. (Refer to Section 7-40.)
8. Perform FWD back tension check/adjustment. (Refer to Section 7-39.)
9. Perform the check after tracking adjustment. (Refer to Section 8-4.)
10. Perform the check of self-recording tape playback. (Refer to Section 8-5.)

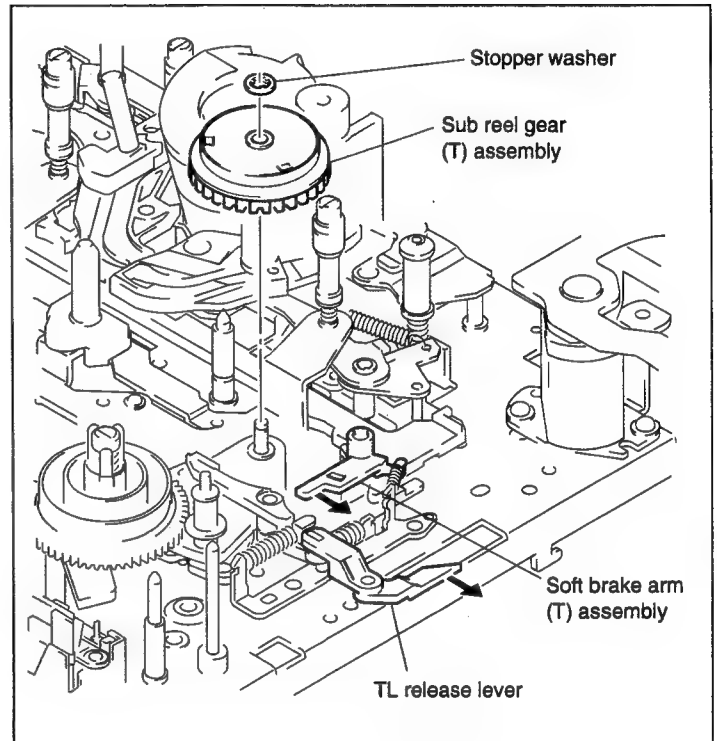


7-11. REPLACEMENT OF SUB REEL GEAR (T) ASSEMBLY

Mode: Unthreading end

Removal/Attachment

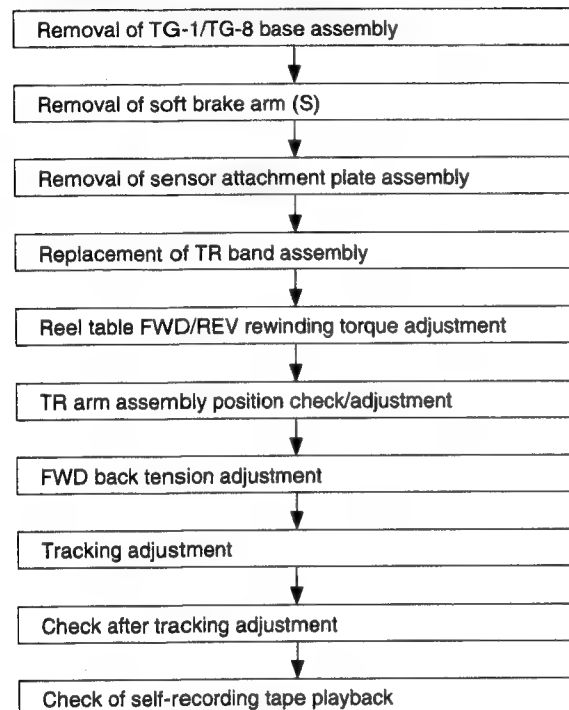
1. Move the soft brake arm (T) and release lever shown in the figure in the arrow direction, and remove the stopper washer and sub reel gear (T) assembly.
2. Attach the sub reel gear (T) assembly in the reverse procedure of step 1.



7-12. REPLACEMENT OF TR BAND ASSEMBLY

Reel table position: Standard cassette position

Replacement Flowchart



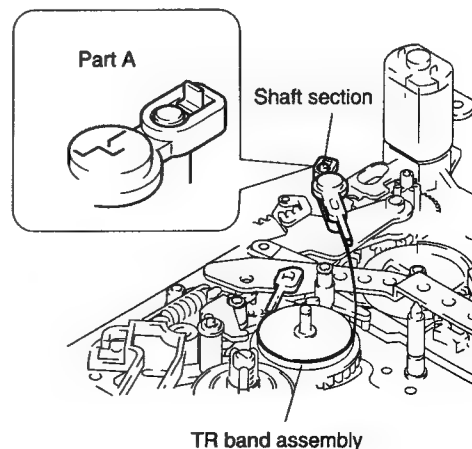
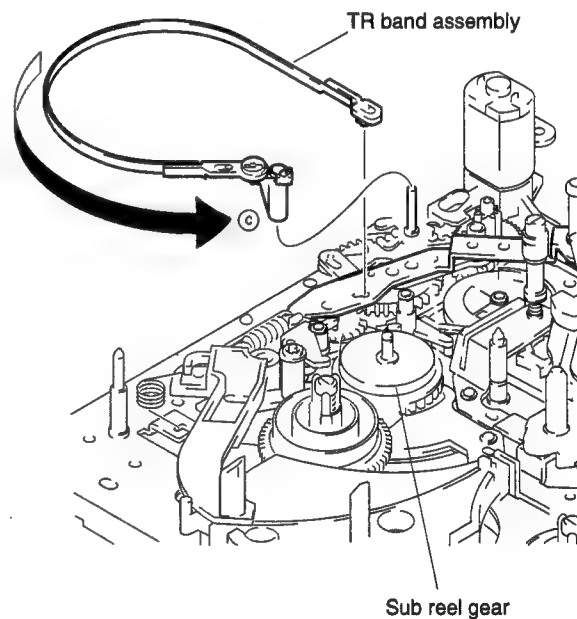
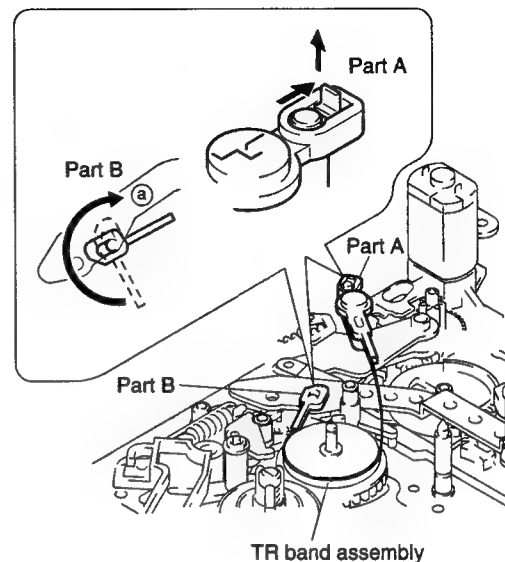
Removal

1. Remove the TG-1/TG-8 base assembly.
(Refer to Section 7-23.)
2. Set to the unthreading end, and remove the soft brake arm (S). (Refer to Section 7-6.)
3. Remove the sensor attachment plate assembly.
(Refer to Section 7-15.)
4. Push part A of the TR band assembly shown in the figure in the arrow direction, and remove it upwards.
5. Set to the threading end, rotate part B of the TR band assembly in arrow direction a, and remove it from the hole of part B.

Attachment

Note: Do not touch the felt part of the TR band assembly.

6. Insert part B of the new TR band assembly in the hole, rotate it in c direction according to the reverse steps of 4 to hold, and wind it around the sub reel gear.
7. Set the TR band to the unthreading end without scratching it, and insert part A of the TR band assembly into the shaft until it locks.
8. Attach the soft brake arm (S), sensor attachment plate assembly and TG-1/TG-8 base assembly.



Adjustment

9. Perform the reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)
10. Perform the TR arm assembly position check/adjustment. (Refer to Section 7-40.)
11. Perform the FWD back tension check/adjustment. (Refer to Section 7-39.)
12. Perform the tracking adjustment.
(Refer to Section 8-3.)
13. Perform the check after tracking adjustment.
(Refer to Section 8-4.)
14. Perform the check of self-recording tape playback. (Refer to Section 8-5.)

7-13. REPLACEMENT OF SHIFT MOTOR ASSEMBLY

The shift motor assembly can be replaced with the cassette compartment attached.

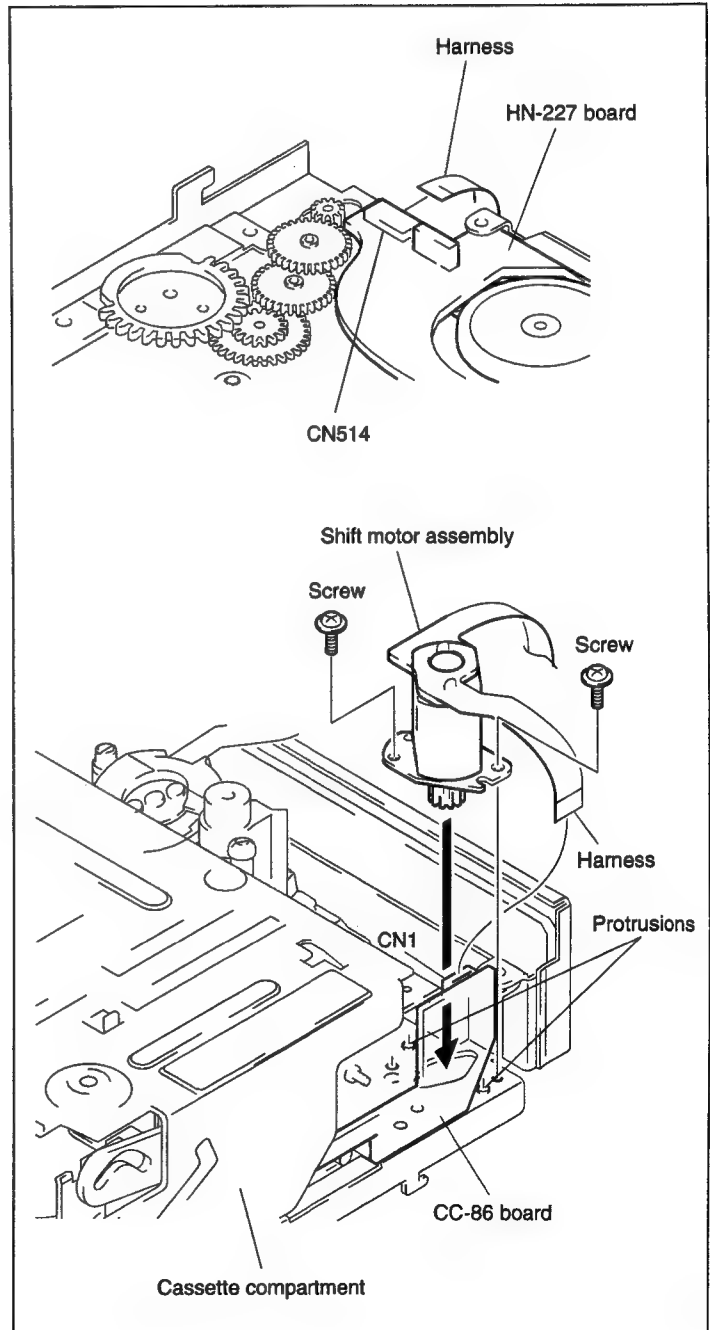
Mode: Unthreading end

Removal

1. Remove the SV-213 board.
(Refer to Section 3-9-8.)
2. Pull out the harness from the CN514 connector of the HN-227 board shown in the figure.
3. Pull out the harness from the CN1 connector of the CC-86 board shown in the figure.
4. Remove the two screws and remove the shift motor assembly.

Attachment

5. Adjust the new shift motor to the two protrusions shown in the figure, and attach with the two screws.
6. Attach the harness and SV-213 board in the reverse order of steps 1 to 3.



7-14. REPLACEMENT OF LD MOTOR ASSEMBLY

The components of the LD motor assembly include the worm shaft assembly. This Section explains the LD motor assembly and worm shaft assembly.

Removal

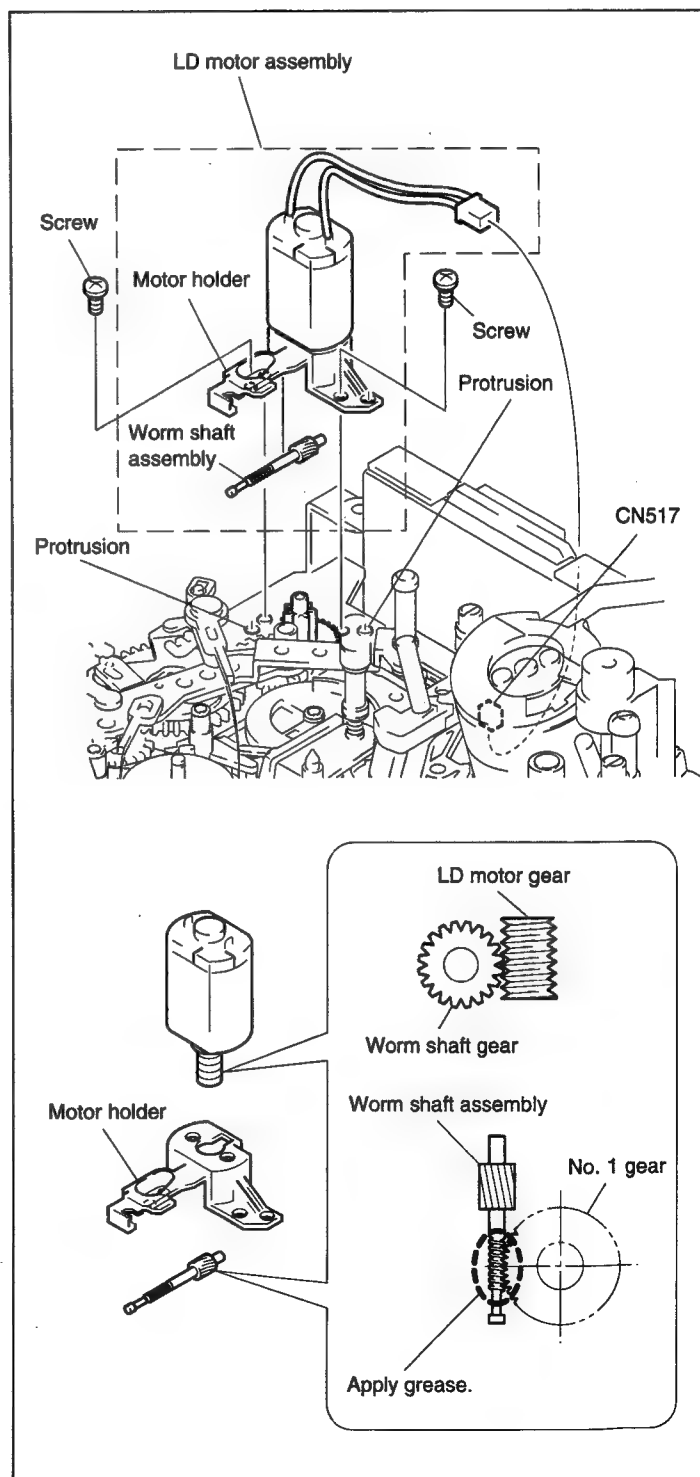
1. Disconnect the connector (CN517) of the LD motor assembly shown in the figure.
2. Remove the two screws, and remove the LD motor assembly.
3. Remove the worm shaft assembly from the motor holder.
4. Attach the new worm shaft assembly to the motor holder so that the gears engage as shown in the figure.
5. Apply grease onto the worm shaft assembly.

Attachment

6. Attach the new LD motor assembly to the two protrusions shown in the figure, and secure with the two screws.

Note: After attaching, check to see that the worm shaft assembly and No. 1 gear are engaged as shown in the figure. If not, move No.1 gear up and down so that they are engaged correctly.

7. Insert the connector (CN517) of the LD motor assembly into the HN-227 board.



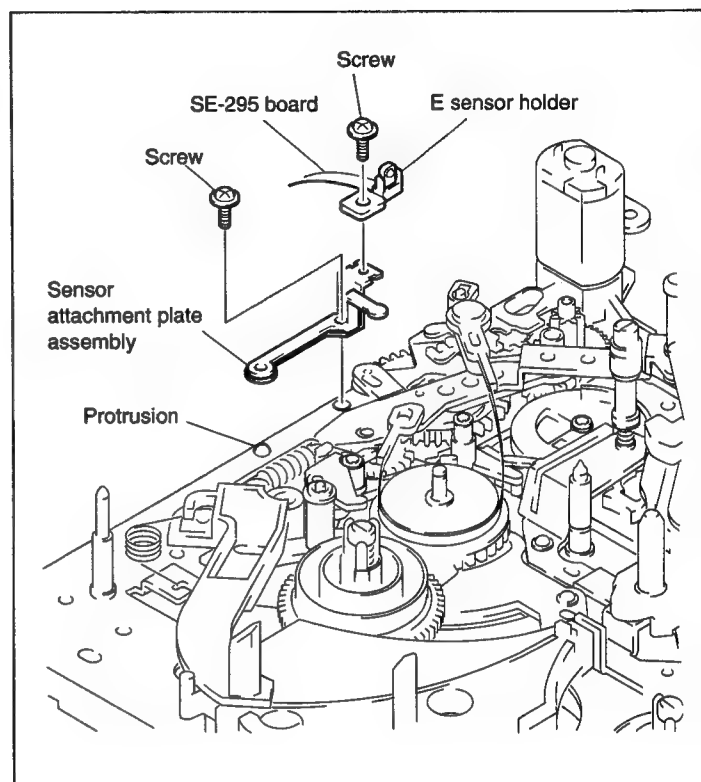
7-15. REPLACEMENT OF SENSOR ATTACHMENT PLATE ASSEMBLY

Removal

1. Remove one screw shown in the figure, and remove the E sensor holder of the SE-295 board.
2. Remove one screw and remove the sensor attachment plate assembly.

Attachment

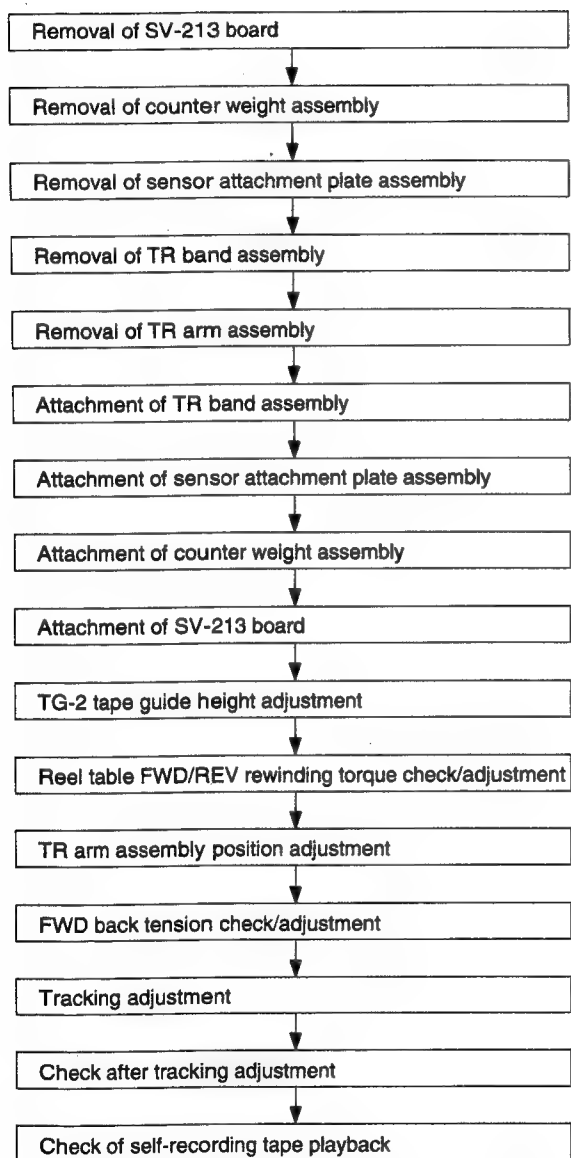
3. Adjust the new sensor attachment plate assembly to the protrusions as shown in figure, and secure with the screw.
4. Attach the E sensor holder in the reverse order of step 1.



7-16. REPLACEMENT OF TR ARM ASSEMBLY

Mode: Threading end

Replacement flowchart



Removal

1. Remove the SV-213 board. (Refer to Section 3-9-8.)
2. Remove the one screw shown in the figure, and remove the counter weight assembly.
3. Remove the sensor attachment plate assembly. (Refer to Section 7-15.)
4. Remove the TR band assembly. (Refer to Section 7-12.)
5. Remove the stopper washer of the TR arm assembly, and remove the cap holder.
6. Remove the TR arm assembly.

Note: When removing the TR arm assembly, be sure to hold parts ⑧ and ⑨ horizontally, and then pull the TR arm assembly upwards vertically. Not pulling them horizontally may cause the following defects.

- 1) Deformation of the crank arm and shaft of the TR arm assembly.
- 2) Scratches on the inside of the bearing of the shaft, and a replacement TR arm assembly can not be attached.

Attachment

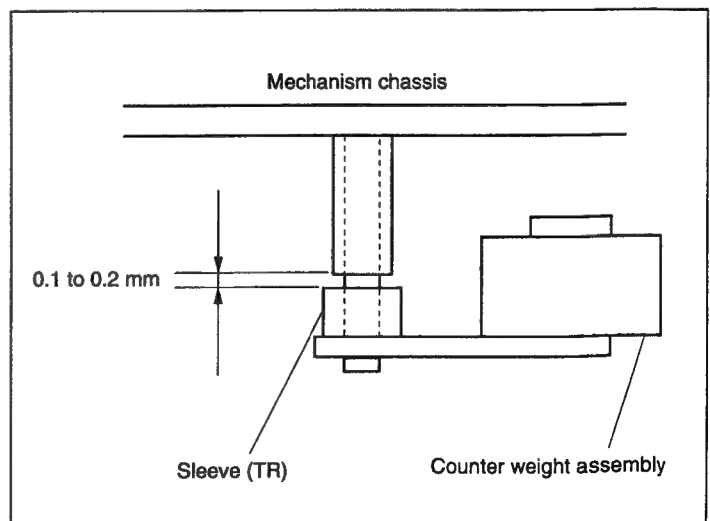
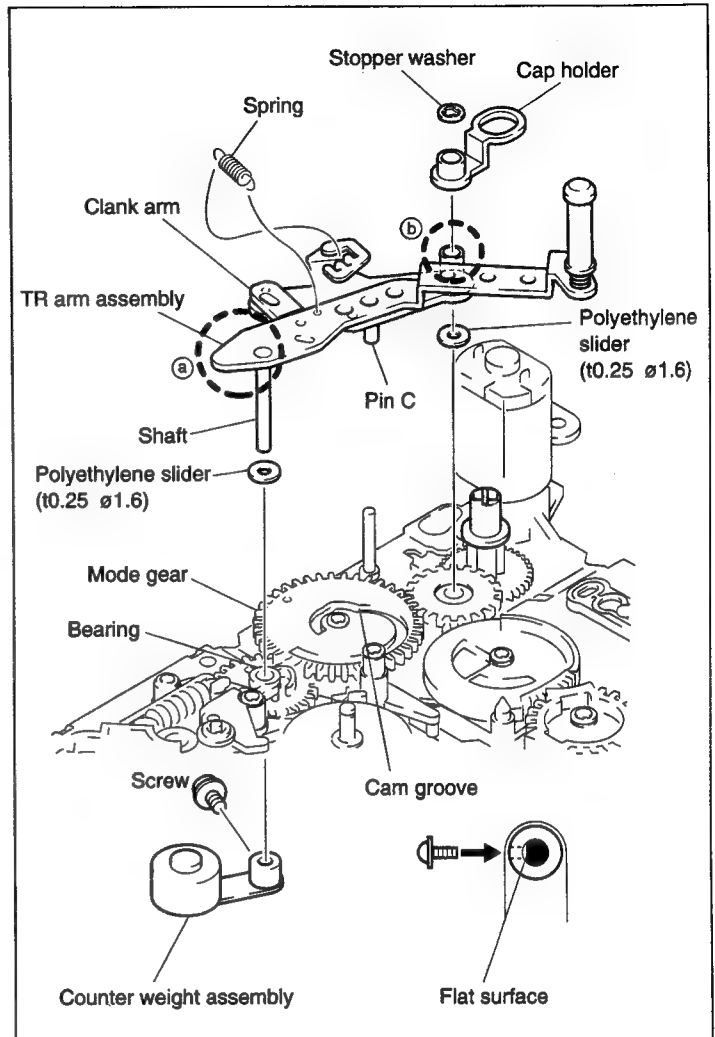
7. Insert Pin C of the TR arm assembly into the cam groove of the mode gear in the reverse order of steps 1 to 6, and insert the shaft into the bearing.

Note: When attaching the counter weight assembly to the shaft of the TR arm assembly, take note of the following.

- 1) Tighten the attaching screw at the flat part of the shaft of the TR arm assembly.
 - 2) Attach so that there is a clearance of 0.1 to 0.2 mm from the sleeve (TR).
8. Attach the SV-213 board. (Refer to Section 3-9-8.)

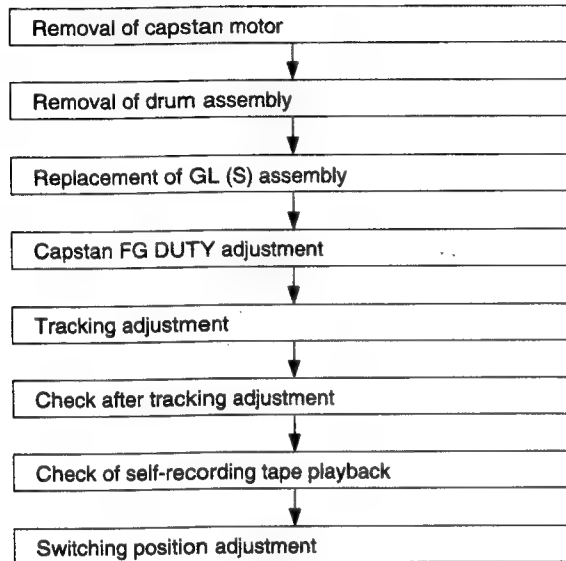
Check/Adjustment

9. Perform TG-2 tape guide height check/adjustment. (Refer to Section 7-37.)
10. Perform the reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)
11. Perform the TR arm assembly position check/adjustment. (Refer to Section 7-40.)
12. Perform FWD back tension check/adjustment. (Refer to Section 7-39.)
13. Perform the tracking adjustment. (Refer to Section 8-3.)
14. Perform the check after tracking adjustment. (Refer to Section 8-4.)
15. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



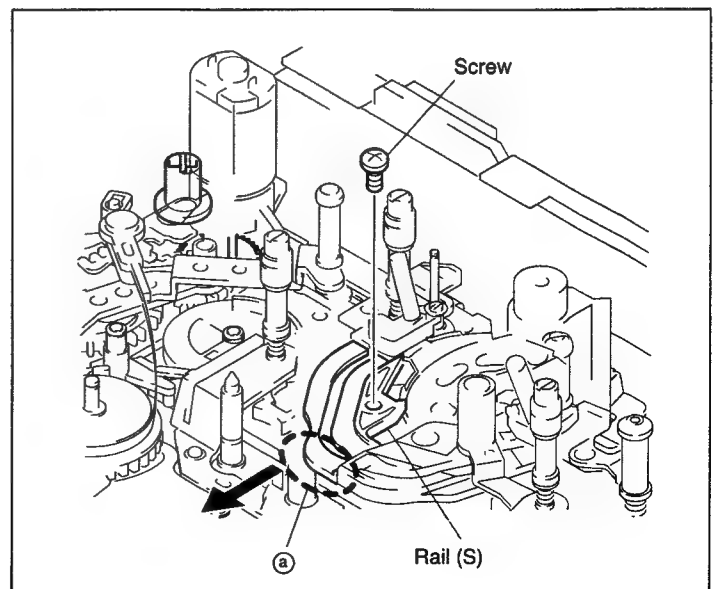
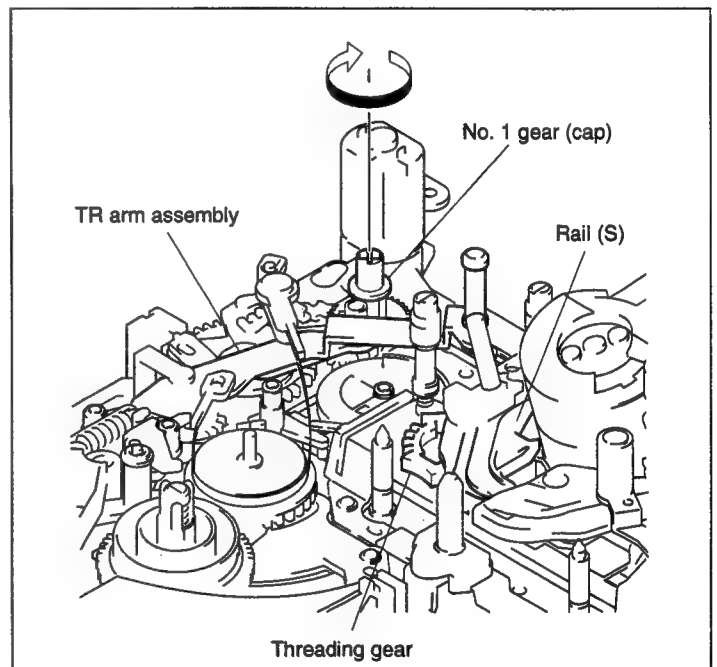
7-17. REPLACEMENT OF GL (S) ASSEMBLY

Replacement Flowchart

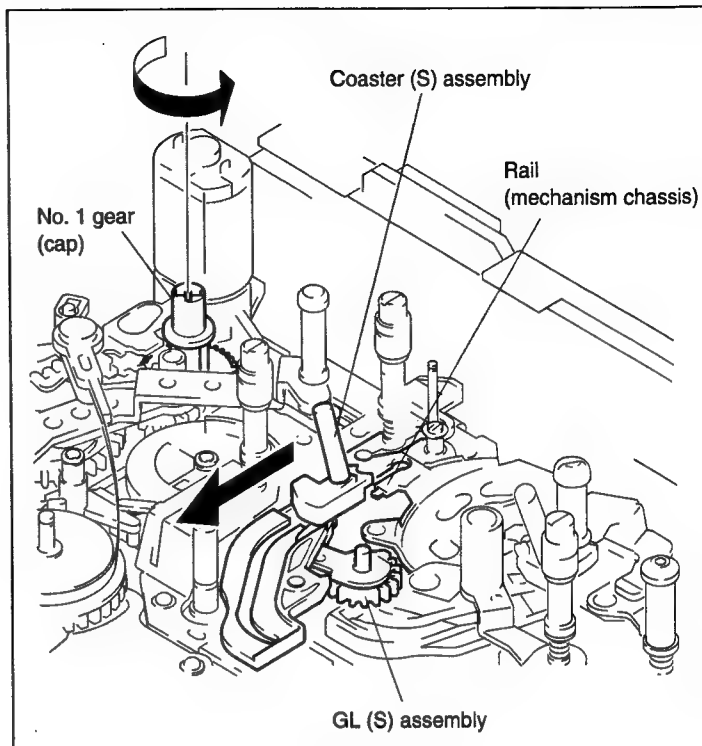


Removal

1. Remove the capstan motor.
(Refer to Section 7-28.)
2. Remove the drum assembly.
(Refer to Section 7-3.)
3. Rotate the No. 1 gear in the clockwise direction until the TR arm assembly separates from rail (S).
4. Remove the screw attaching rail (S), and remove it by holding the (a) part and sliding it in the arrow direction.

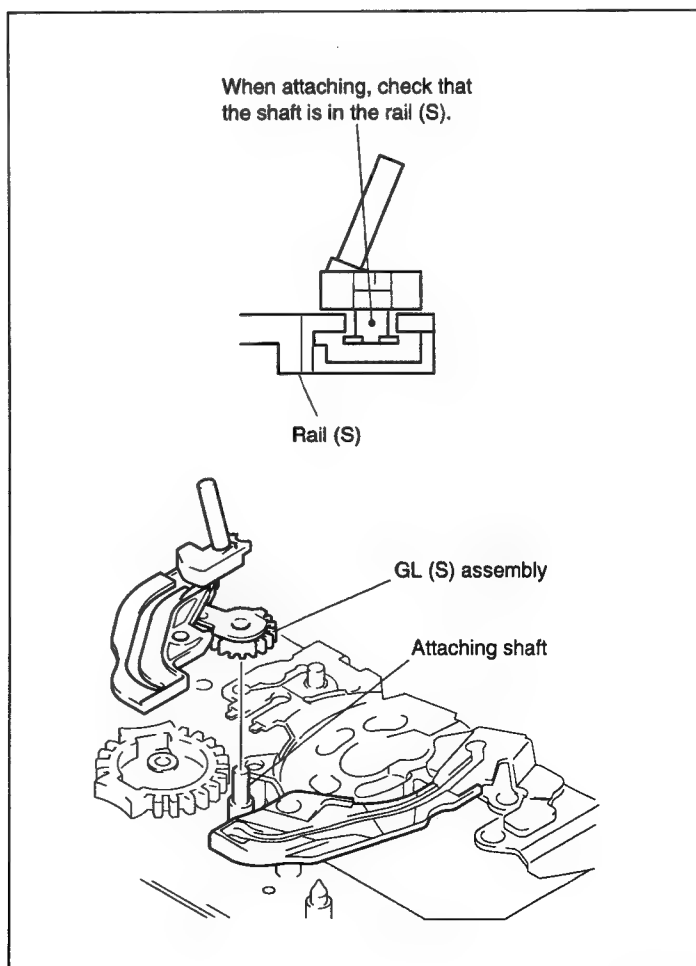


5. Rotate the No. 1 gear in the counterclockwise direction, and remove the coaster (S) assembly and GL (S) assembly from the rail (mechanism chassis).



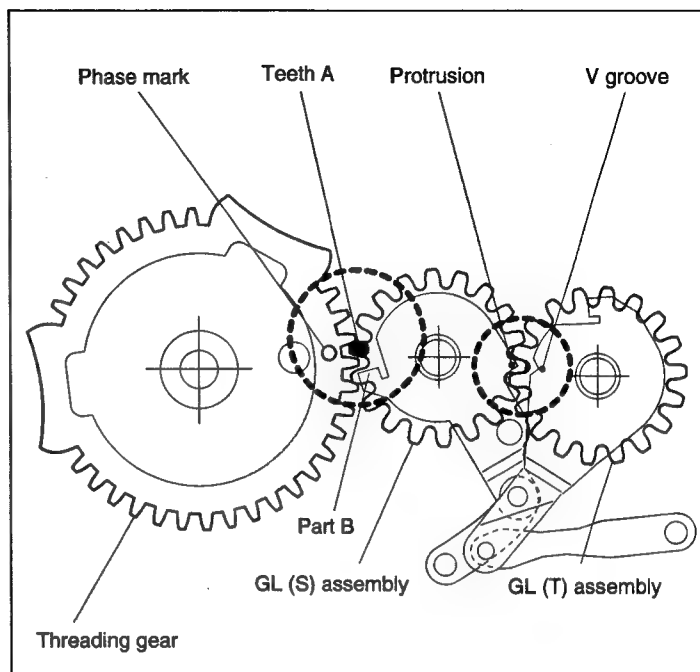
Attachment

6. Attach the coaster (S) assembly to the groove of the rail (S), and then attach the GL (S) assembly.



7. Attach the GL (S) assembly to the attaching shaft.

Note: Adjust the protrusion of the GL (S) assembly to the V groove of the GL (T) assembly as shown in the figure, and attach the threading gear so that the phase mark of the threading gear and teeth A next to part B match.



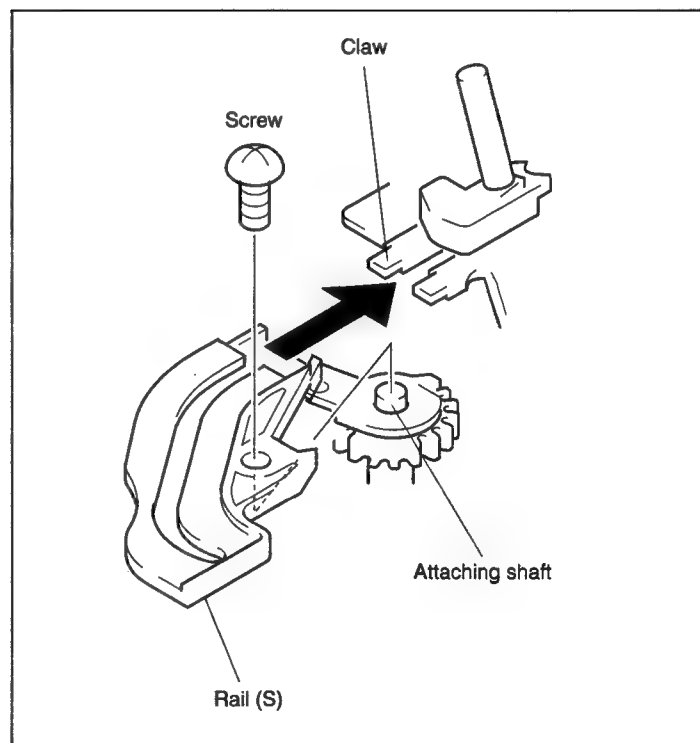
8. Attach rail (S) first from the claw and then the attaching shaft, and tighten the screw.

- Tightening torque: 0.0588 N·m (0.6 kg·cm)

9. Attach the capstan motor and drum assembly in the reverse order of steps 1 and 2.

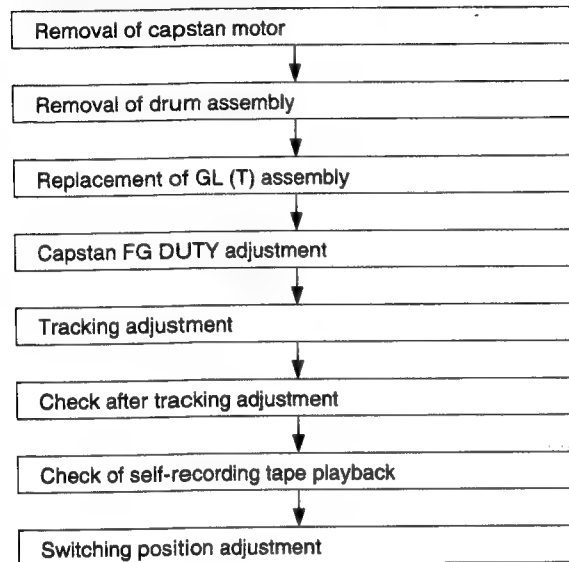
Check/Adjustment

10. Perform the capstan FG DUTY adjustment at Menu M601. (Refer to Section 11-2-1.)
11. Perform the tracking adjustment. (Refer to Section 8-3.)
12. Perform the check after tracking adjustment. (Refer to Section 8-4.)
13. Perform the check of self-recording tape playback. (Refer to Section 8-5.)
14. Perform the switching position adjustment at Menu M605. (Refer to Section 8-6.)



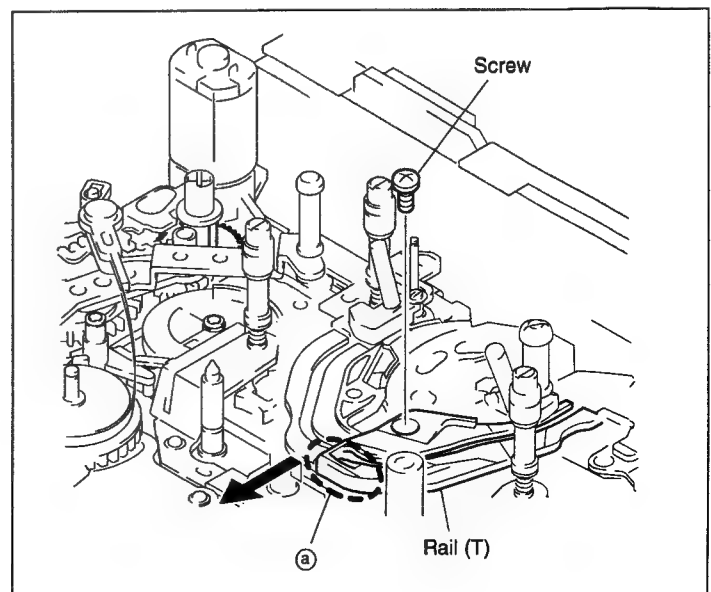
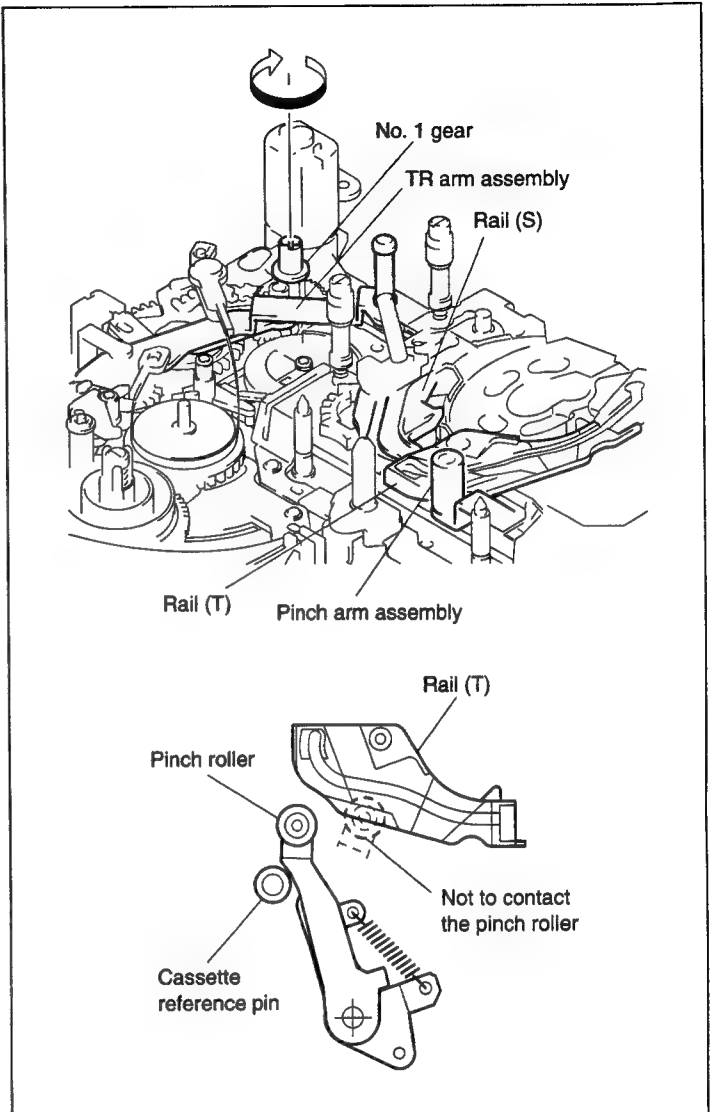
7-18. REPLACEMENT OF GL (T) ASSEMBLY

Replacement Flowchart

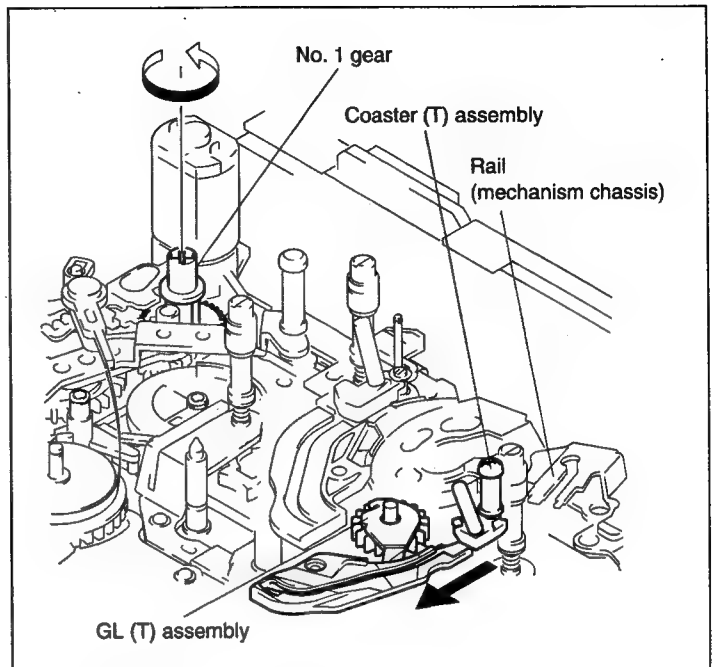


Removal

1. Remove the capstan motor.
(Refer to Section 7-28.)
2. Remove the drum assembly.
(Refer to Section 7-3.)
3. Rotate the No. 1 gear in the clockwise direction, and remove the TR arm assembly from rail (S). Make sure that the pinch roller is not in contact with rail (T).
4. Remove the screw attaching rail (T), lift up part ① and slide it in the arrow direction and remove rail (T).

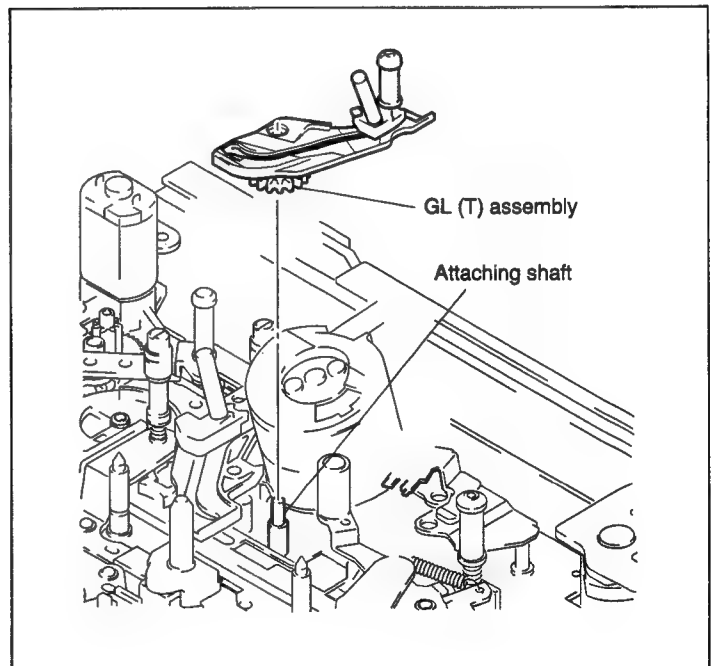


5. Rotate the No. 1 gear in the counterclockwise direction, and remove the coaster (T) assembly and GL (T) assembly from the rail (mechanism chassis).



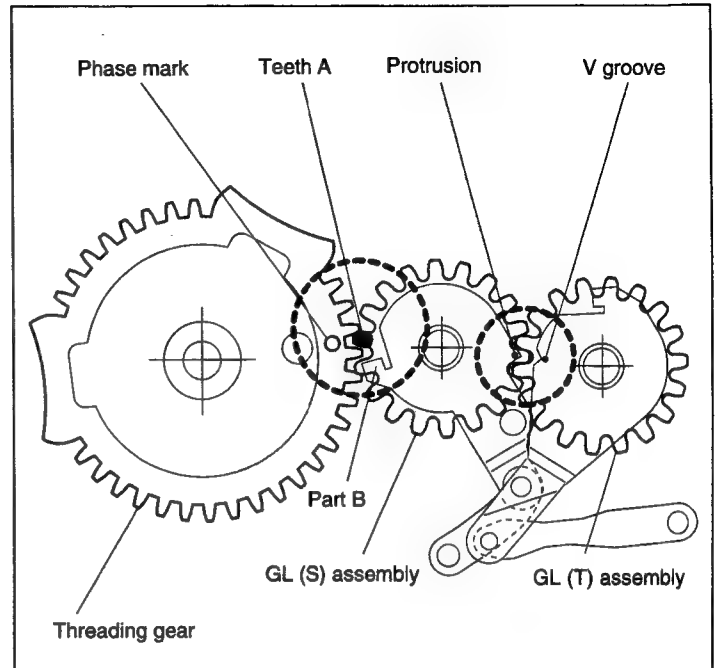
Attachment

6. Attach the coaster (T) assembly to the groove of rail (T), and then attach the GL (T) assembly.



7. Attach the GL (T) assembly to the attaching shaft.

Note: Adjust the protrusion of the GL (S) assembly to the V groove of the GL (T) assembly as shown in the figure, and attach the threading gear so that the phase mark of the threading gear and teeth A next to part B match.



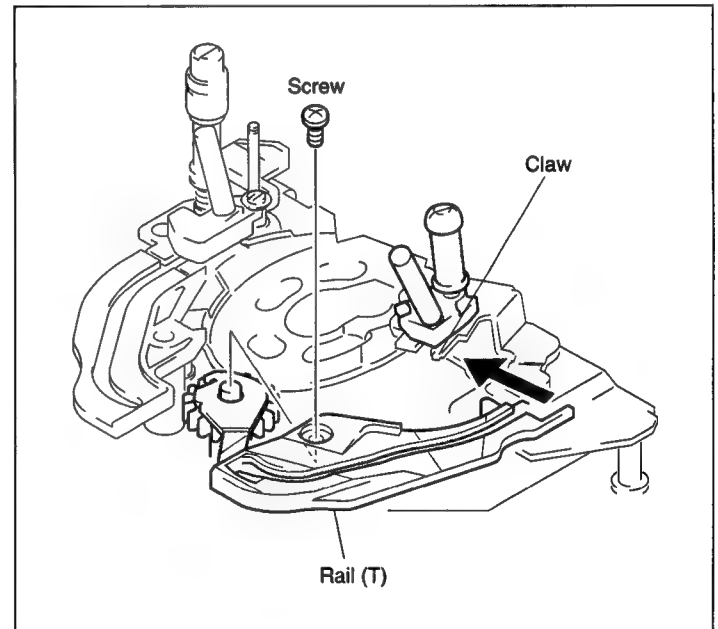
8. Attach rail (T) first from the claw and then the attaching shaft, and tighten the screw.

- Tightening torque: 0.0588 N•m (0.6 kg•cm)

9. Attach the capstan motor and drum assembly in the reverse order of steps 1 and 2.

Check/Adjustment

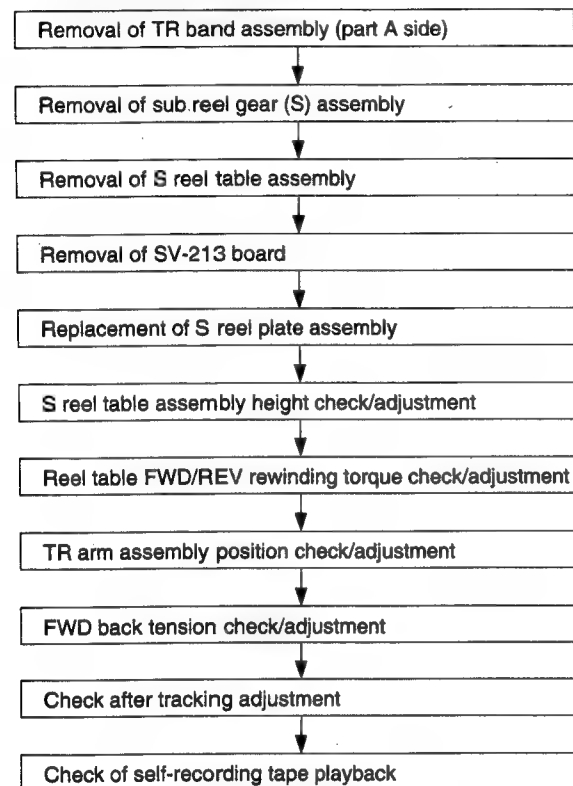
10. Perform the capstan FG DUTY adjustment at Menu M601. (Refer to Section 11-2-1.)
11. Perform the tracking adjustment. (Refer to Section 8-3.)
12. Perform the check after tracking adjustment. (Refer to Section 8-4.)
13. Perform the check of self-recording tape playback. (Refer to Section 8-5.)
14. Perform the switching position adjustment at Menu M605. (Refer to Section 8-6.)



7-19. REPLACEMENT OF S REEL PLATE ASSEMBLY

Reel table position: Standard cassette position

Replacement Flowchart



Removal

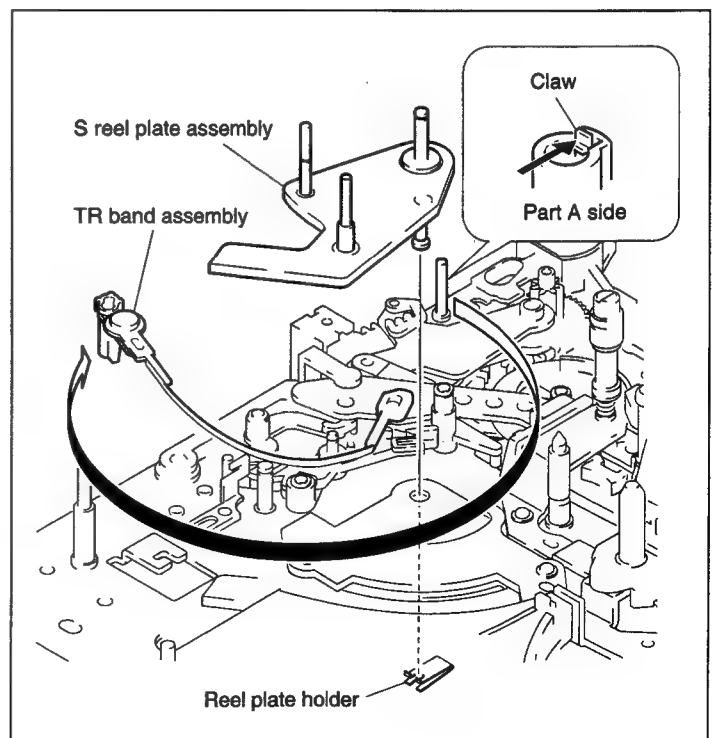
1. Remove the TR band assembly (part A side).
2. Remove the sub reel gear (S) assembly.
(Refer to Section 7-10.)
3. Remove the S reel table assembly.
(Refer to Section 7-4.)
4. Remove the SV-213 board.
(Refer to Section 3-9-8.)
5. Remove the reel plate holder shown in the figure, and remove the S reel plate assembly.

Attachment

6. Attach the new S reel plate assembly in the reverse order of step 5.
7. Attach the parts removed in the reverse order of steps 1 to 4.

Check/Adjustment

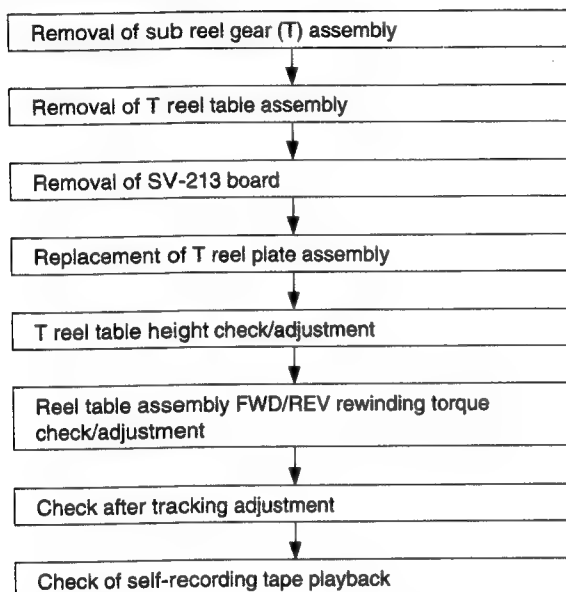
8. Perform S reel table height check/adjustment. (Refer to Section 7-36.)
9. Perform the reel table assembly FWD/REV rewinding torque check/adjustment.
(Refer to Section 7-38.)
10. Perform TR arm assembly position check/adjustment. (Refer to Section 7-40.)
11. Perform the FWD back tension check/adjustment. (Refer to Section 7-39.)
12. Perform the check after tracking adjustment.
(Refer to Section 8-4.)
13. Perform the check of self-recording tape playback.
(Refer to Section 8-5.)



7-20. REPLACEMENT OF T REEL PLATE ASSEMBLY

Reel table position: Standard cassette position

Replacement Flowchart



Removal

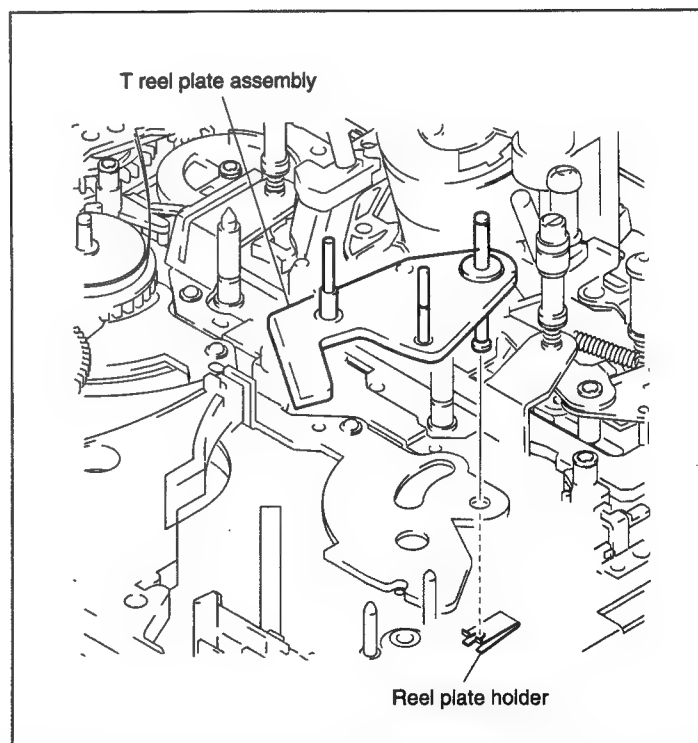
1. Remove the sub reel gear (T) assembly.
(Refer to Section 7-11.)
2. Remove the T reel table assembly.
(Refer to Section 7-5.)
3. Remove the SV-213 board.
(Refer to Section 3-9-8.)
4. Remove the reel plate holder shown in the figure, and remove the T reel plate assembly.

Attachment

5. Attach the new T reel plate assembly in the reverse order of step 4.
6. Attach the parts removed in the reverse order of steps 1 to 3.

Check/Adjustment

7. Perform T reel table height check/adjustment.
(Refer to Section 7-36.)
8. Perform the reel table assembly FWD/REV rewinding torque check/adjustment.
(Refer to Section 7-38.)
9. Perform the check after tracking adjustment.
(Refer to Section 8-4.)
10. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



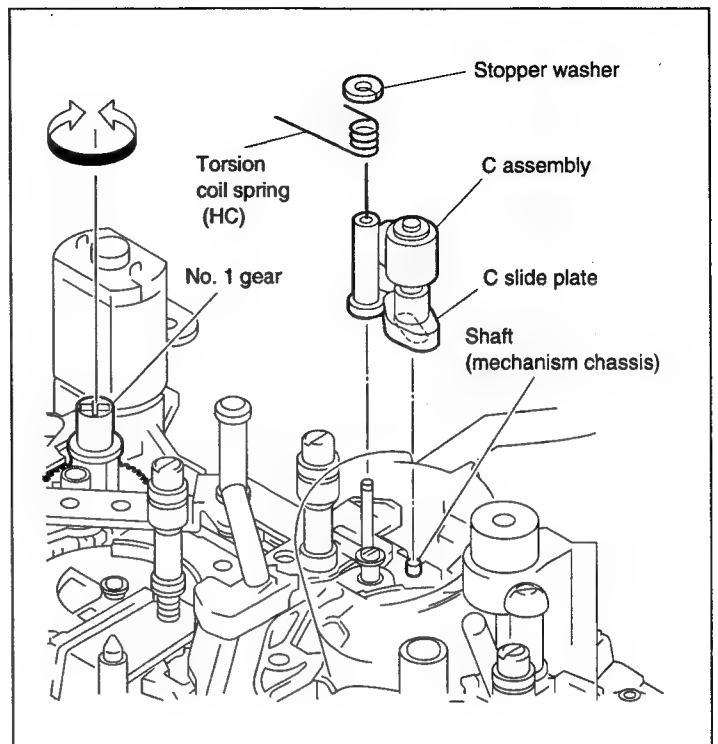
7-21. REPLACEMENT OF C ASSEMBLY

Removal/Attachment

1. Remove the stopper washer shown in the figure, and remove the C assembly and torsion coil spring (HC).
2. Attach the new C assembly and torsion coil spring (HC) with the stopper washer.

Note: When attaching, check that the shaft of the mechanism chassis is inserted into the long hole of the C slide plate.

3. Rotate the No. 1 gear, and check that the C assembly moves to the left and right.



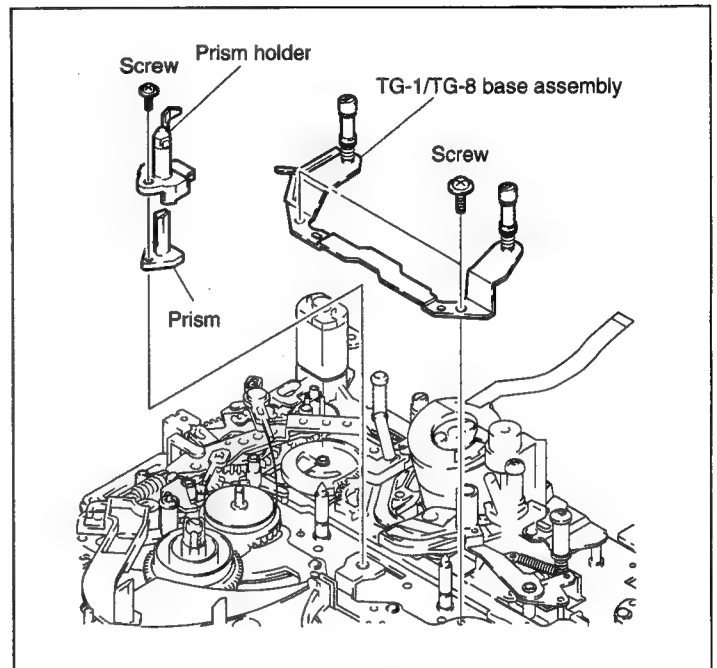
7-22. REPLACEMENT OF PINCH ARM ASSEMBLY

Reel table position: Standard cassette position
Mode: Unthreading end

Removal

1. Remove one screw shown in the figure, and remove the prism holder and prism.
2. Check that the S reel table and T reel table are at the standard cassette position, and remove the two screws shown in the figure, and remove the TG-1/TG-8 base assembly.

Note: When removing the TG-1/TG-8 base assembly, hold the base instead of the guide.



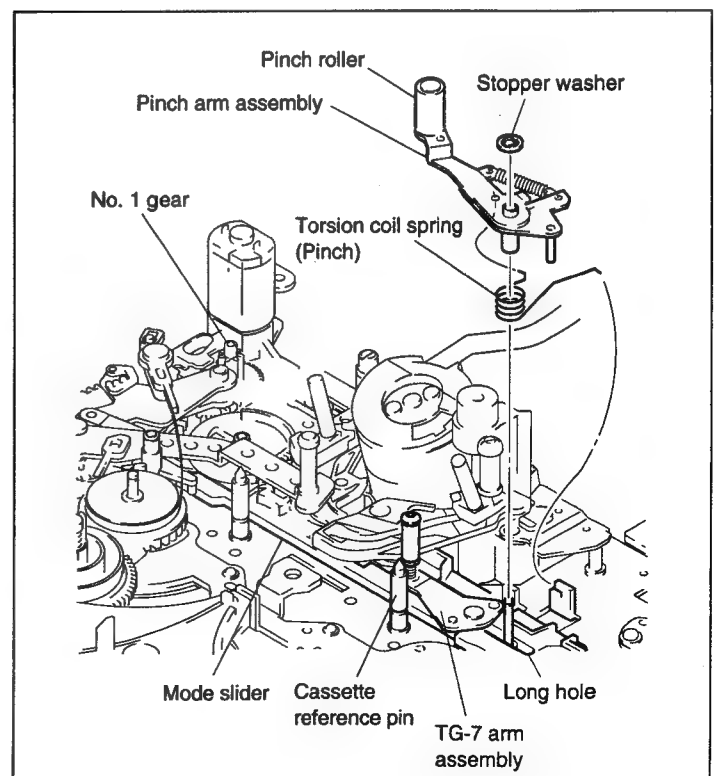
3. Remove the stopper washer, and remove the pinch arm assembly and torsion coil spring (pinch).

Attachment

4. Set the new pinch arm assembly between the cassette reference pin and TG-7 arm assembly, and attach to the unit with the torsion coil spring (pinch) using the stopper washer.

Note: When attaching, never touch the pinch roller.

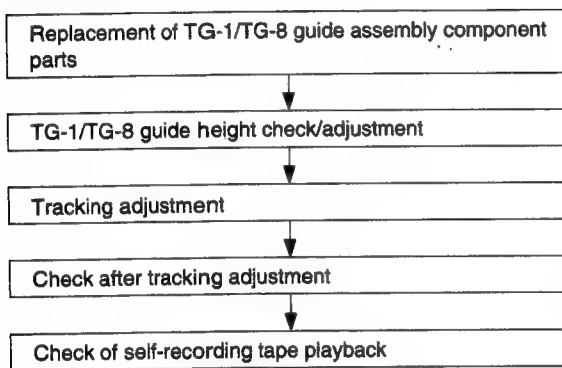
5. Attach the parts removed in the reverse order of steps 1 to 3.
6. Rotate the No. 1 gear in the clockwise and counterclockwise direction, and check that the pinch arm moves smoothly.
7. Perform TG-1/TG-8 tape guide height check/adjustment. (Refer to Section 7-37.)
8. Perform the check after tracking adjustment. (Refer to Section 8-4.)
9. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



7-23. REPLACEMENT OF TG-1/TG-8 GUIDE ASSEMBLY COMPONENT PARTS

The TG-1 guide assembly and TG-8 guide assembly component parts can be replaced in the same way. This Section explains how to replace the TG-1 guide assembly component parts.

Replacement Flowchart



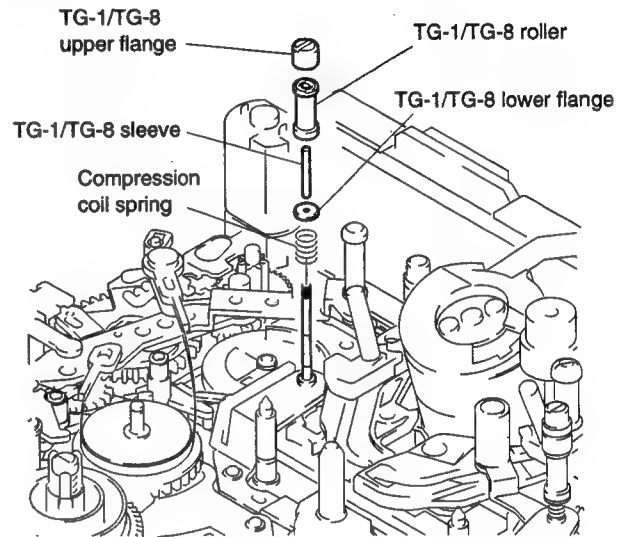
Removal/Attachment

1. Rotate the guide upper flange shown in the figure in the counterclockwise direction, and remove the TG-1 guide assembly component parts.
2. Replace the required parts, and attach the component parts in the reverse order of step 1.
3. Perform TG-1 guide height check / adjustment. (Refer to Section 7-37.)

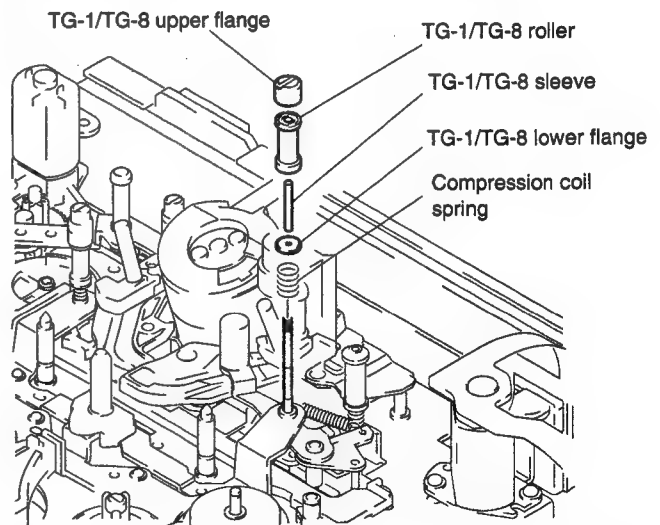
Check/Adjustment

4. Perform the tracking adjustment. (Refer to Section 8-3.)
5. Perform the check after tracking adjustment. (Refer to Section 8-4.)
6. Perform the check of self-recording tape playback. (Refer to Section 8-5.)

TG-1 guide assembly component parts

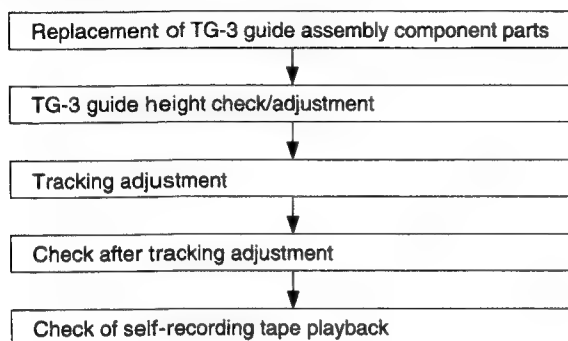


TG-8 guide assembly component parts



7-24. REPLACEMENT OF TG-3 GUIDE ASSEMBLY COMPONENT PARTS

Replacement Flowchart

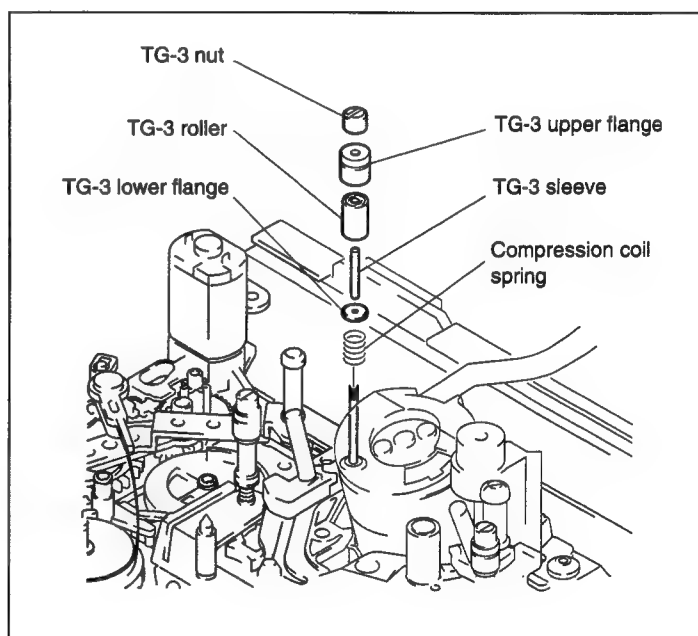


Removal/Attachment

1. Rotate the guide upper flange shown in the figure in the counterclockwise direction, and remove the TG-3 guide assembly component parts.
2. Replace the required parts, and attach the component parts in the reverse order of step 1.

Check/Adjustment

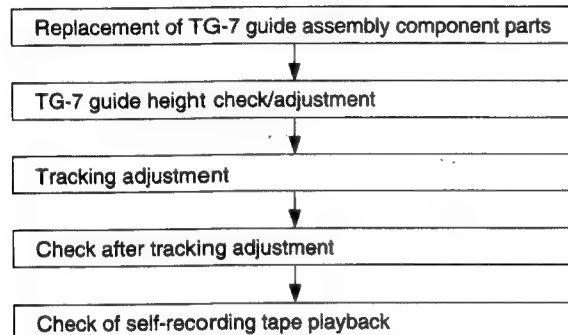
3. Perform TG-3 guide height check adjustment. (Refer to Section 7-37.)
4. Perform the tracking adjustment. (Refer to Section 8-3.)
5. Perform the check after tracking adjustment. (Refer to Section 8-4.)
6. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



7-25. REPLACEMENT OF TG-7 GUIDE ASSEMBLY COMPONENT PARTS

Mode: Threading end

Replacement Flowchart

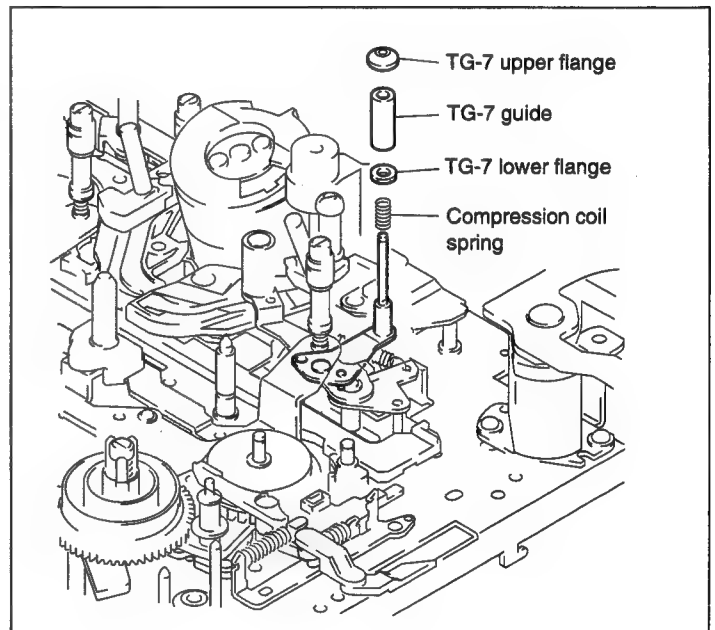


Removal/Attachment

1. Rotate the TG-7 upper flange shown in the figure in the counterclockwise direction, and remove the TG-7 guide assembly component parts.
2. Replace the required parts, and attach the component parts in the reverse order of step 1.

Check/Adjustment

3. Perform TG-7 guide height check/adjustment. (Refer to Section 7-37.)
4. Perform the tracking adjustment. (Refer to Section 8-3.)
5. Perform the check after tracking adjustment. (Refer to Section 8-4.)
6. Perform the check of self-recording tape playback. (Refer to Section 8-5.)

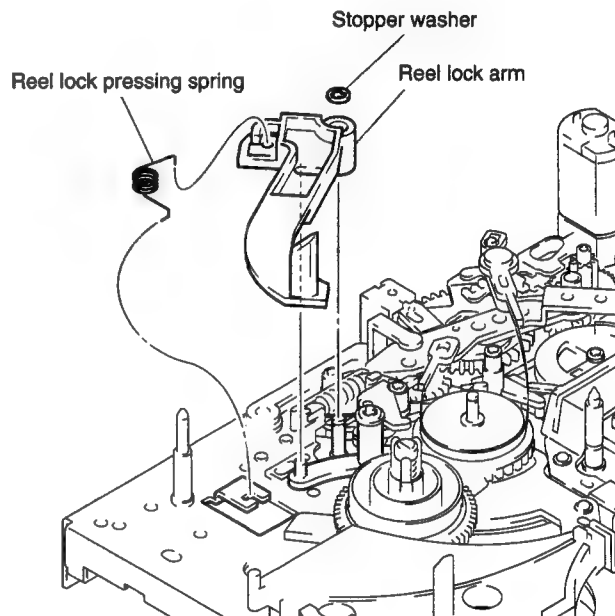


7-26. REPLACEMENT OF IDLER GEAR ASSEMBLY

Reel table position: Standard cassette position
Mode: Threading end

Removal

1. Remove the reel lock pressing spring and stopper washer shown in the figure, and remove the reel lock arm.

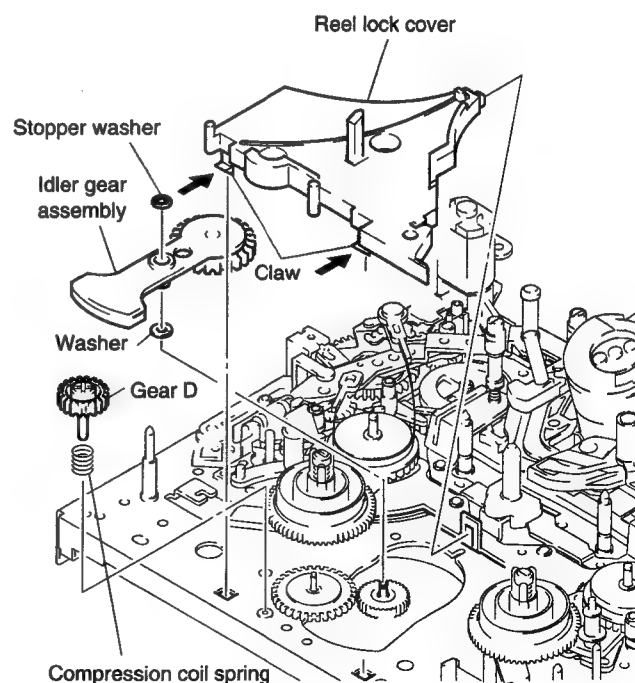


2. While pushing in the two claws in the arrow direction, remove the reel lock cover.

Note: When the reel lock cover is removed, gear D and the compression coil spring will also be removed with it. Be careful not to lose them.

3. Remove the stopper washer shown in the figure, and remove the idler gear assembly.

Note: When the idler gear assembly is removed, the washer shown in the figure will also be removed with it. Be careful not to lose the washer.



Attachment

4. Attach the new idler gear assembly in the reverse order of step 3.
5. Attach the parts removed in the reverse order of steps 1 and 2.

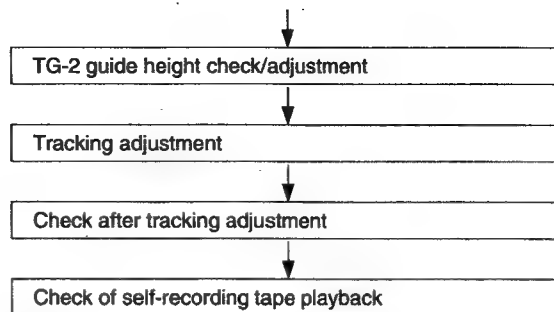
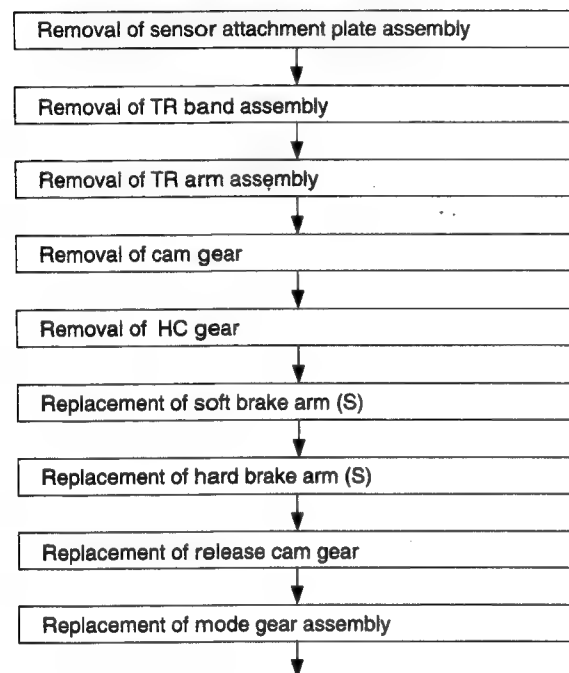
Check/Adjustment

6. Perform reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)

7-27. REPLACEMENT OF MODE GEAR ASSEMBLY

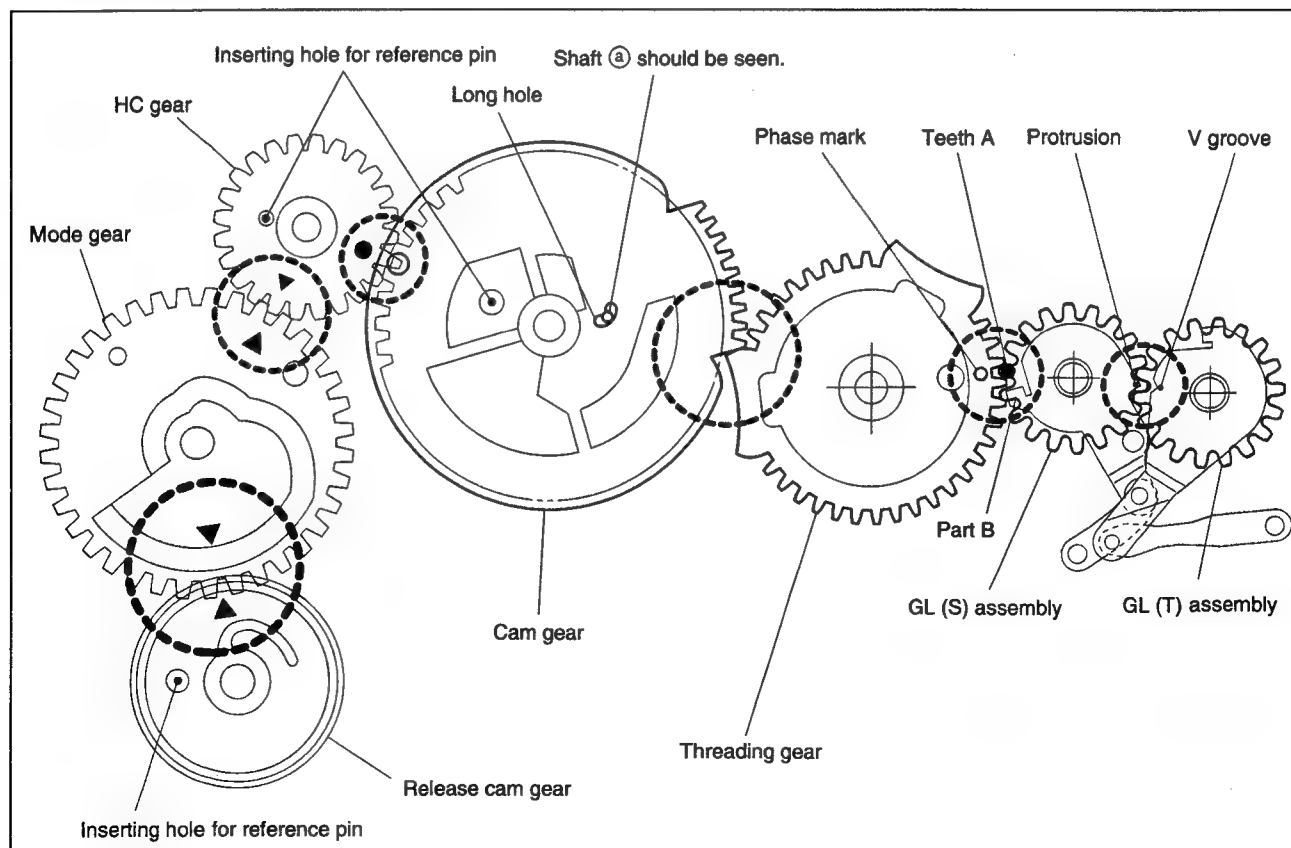
Reel table position: Standard cassette position

Replacement Flowchart



Removal

1. Remove the sensor attachment plate assembly. (Refer to Section 7-15.)
2. Remove the TR band assembly. (Refer to Section 7-12.)
3. Remove the TR arm assembly. (Refer to Section 7-16.)
4. Rotate No. 1 gear in the counterclockwise direction to set it in the unthreading condition.
5. Insert the reference pin at the position shown in the figure, and adjust the phase of each gear.
6. Remove the cam gear.
7. Remove the HC gear.
8. Remove the soft brake arm (S). (Refer to Section 7-16.)
9. Remove the hard brake arm (S). (Refer to Section 7-7.)
10. Remove the release cam gear.



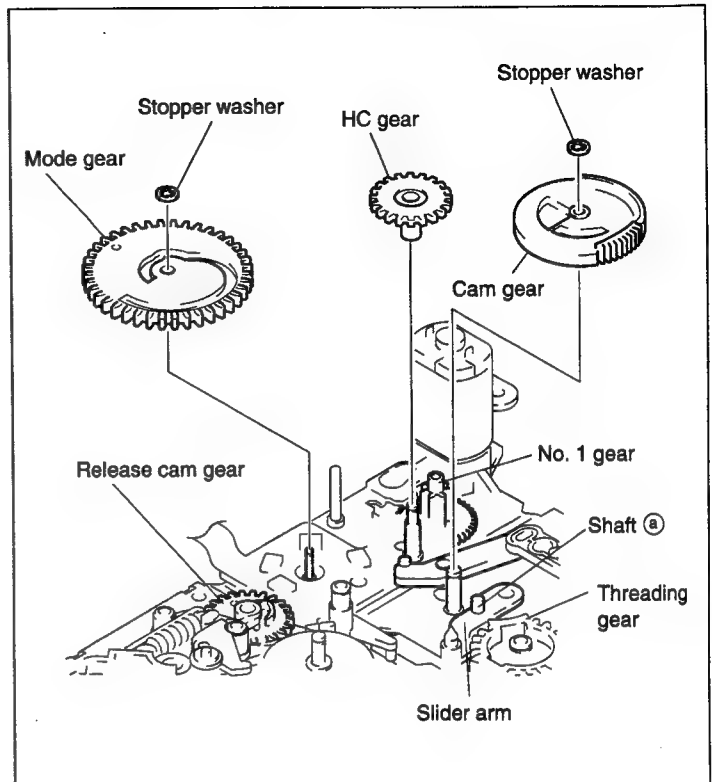
11. Remove the stopper washer shown in the figure, and remove the mode gear assembly.

Attachment

12. Attach the new mode gear assembly in the reverse order of step 11.

Note: Insert the reference pin into the hole of the mode gear when attaching, and adjust the phase.

- 1) Adjust the protrusion of the GL (S) assembly to the V groove of the GL (T) assembly as shown in the figure, and attach the threading gear so that the phase mark of the threading gear and teeth A next to part B match.
 - 2) Match the phases of the cam gear and threading gear, and check that shaft ① of the slider arm can be seen from the long hole of the cam gear.
13. Pull out the reference pin.
14. Attach the parts removed in the order steps 10, 9, 8, 7, 6, 3, 2, 1.



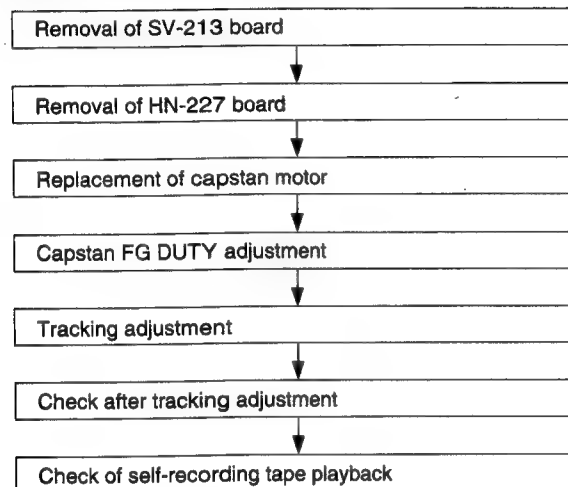
Check/Adjustment

15. Perform TG-2 guide height check/adjustment.
(Refer to Section 7-37.)
16. Perform the tracking adjustment.
(Refer to Section 8-3.)
17. Perform the check after tracking adjustment.
(Refer to Section 8-4.)
18. Perform the check of self-recording tape playback. (Refer to Section 8-5.)

7-28. REPLACEMENT OF CAPSTAN MOTOR

Mode: Unthreading end

Replacement Flowchart



Removal

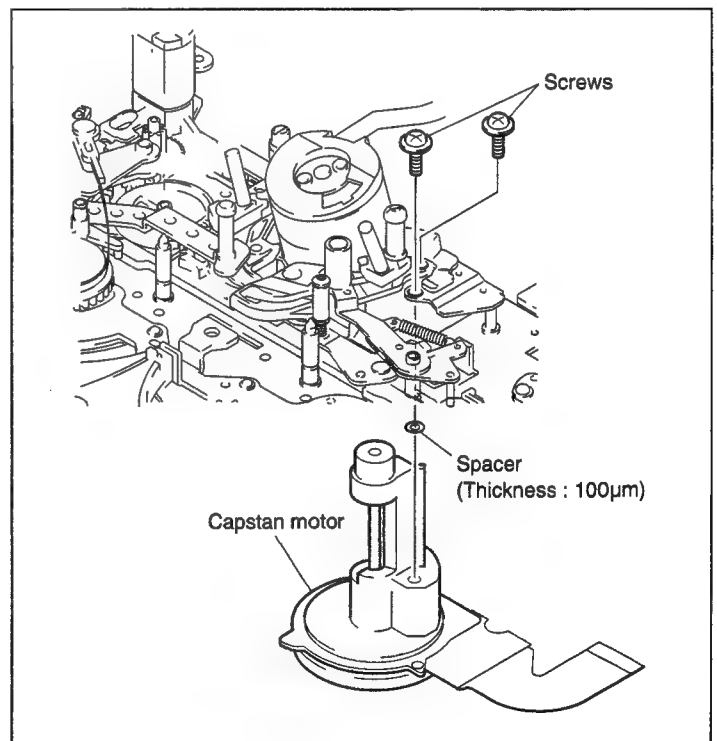
1. Remove the SV-213 board.
(Refer to Section 3-9-8.)
2. Remove the HN-227 board.
(Refer to Section 3-9-9.)
3. Remove the two screws shown in the figure, and remove the capstan motor and spacer.

Attachment

4. Attach the new capstan motor and spacer in the reverse order of step 3.
5. Attach the parts removed in the reverse order of steps 1 and 2.

Check/Adjustment

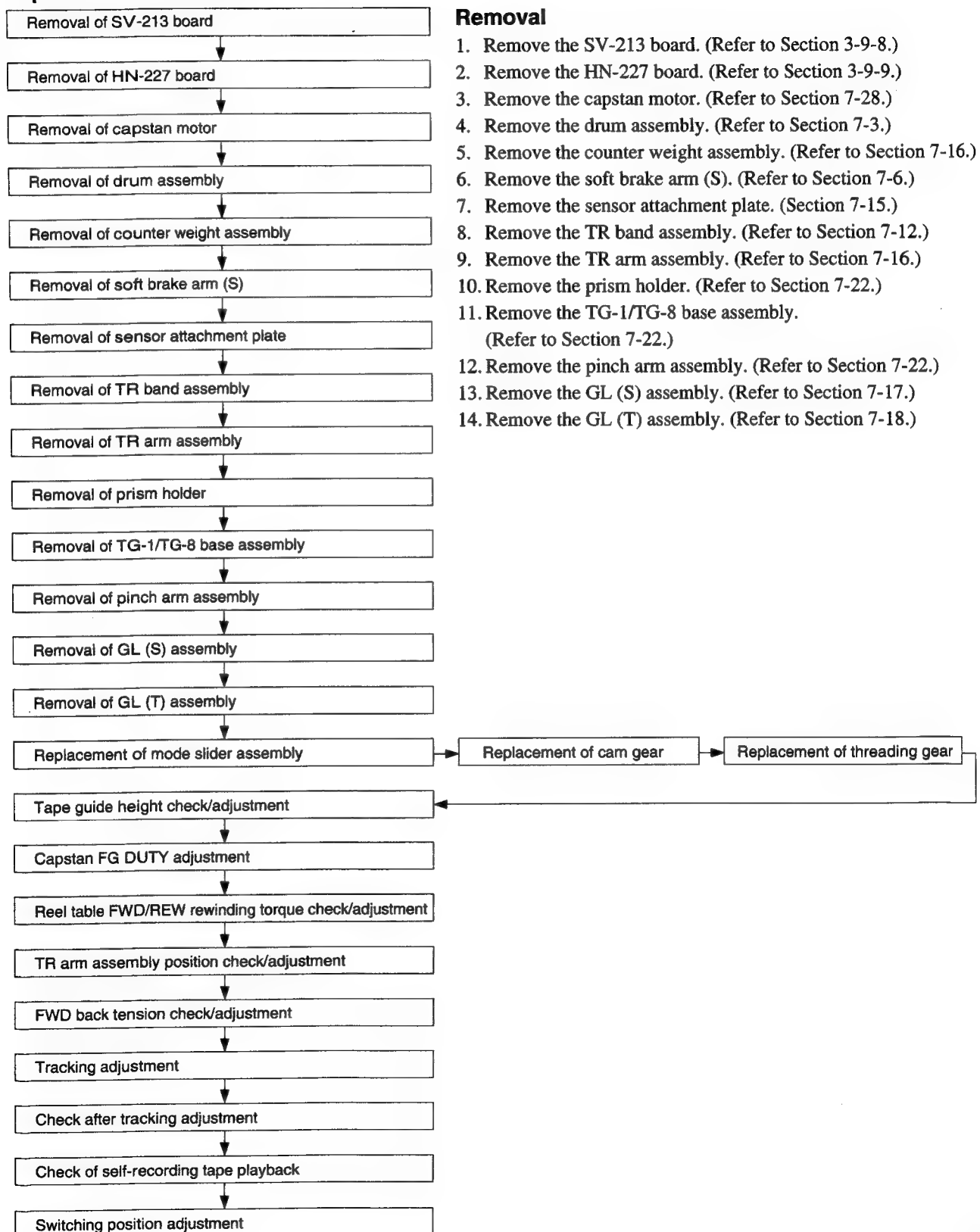
6. Perform the capstan FG DUTY adjustment at Menu M601. (Refer to Section 11-2-1.)
7. Perform the tracking adjustment.
(Refer to Section 8-3.)
8. Perform the check after tracking adjustment.
(Refer to Section 8-4.)
9. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



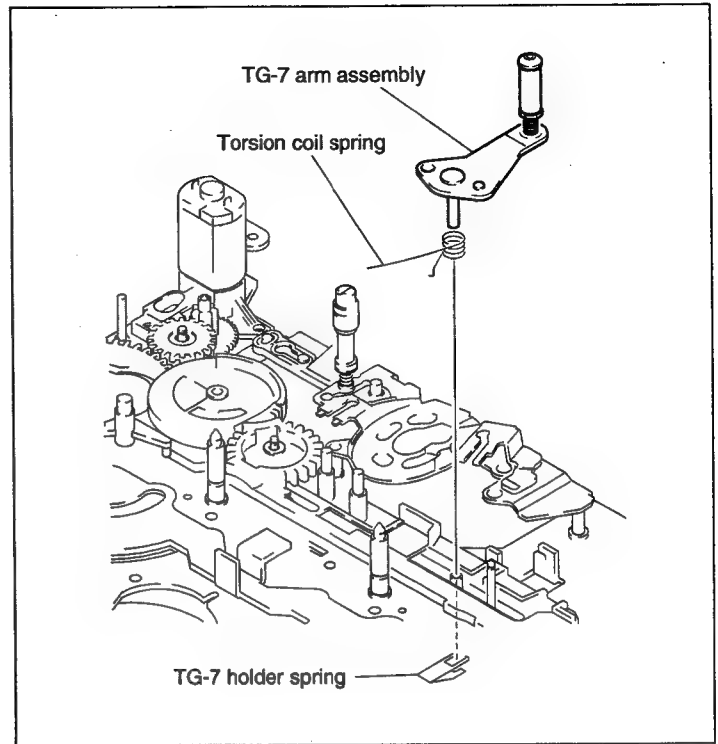
7-29. REPLACEMENT OF MODE SLIDER / CAM GEAR / THREADING GEAR

Mode: Unthreading end

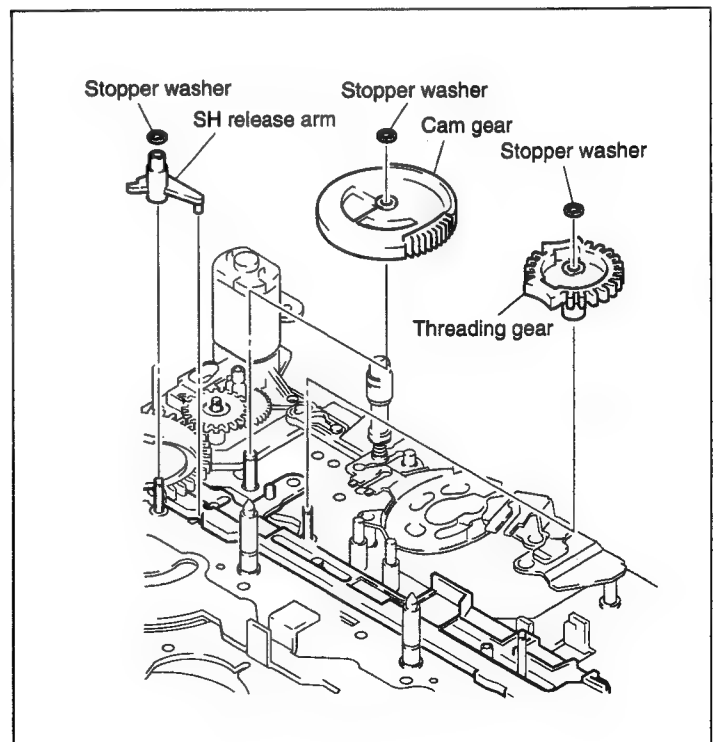
Replacement Flowchart



15. Remove the TG-7 holder spring, and remove the TG-7 arm assembly and torsion coil spring.



16. Remove the stopper washer, and remove the SH release arm.
17. Remove the stopper washer, and remove the threading gear.
18. Remove the stopper washer, and remove the cam gear.



19. Remove the stopper washer shown in the figure, and remove the mode slider.

Attachment

20. Attach the new mode slider in the reverse order of step 19.
Apply grease on to the portion of the mode slider shown in the figure.
21. Attach the parts removed in the reverse order of steps 1 to 18.

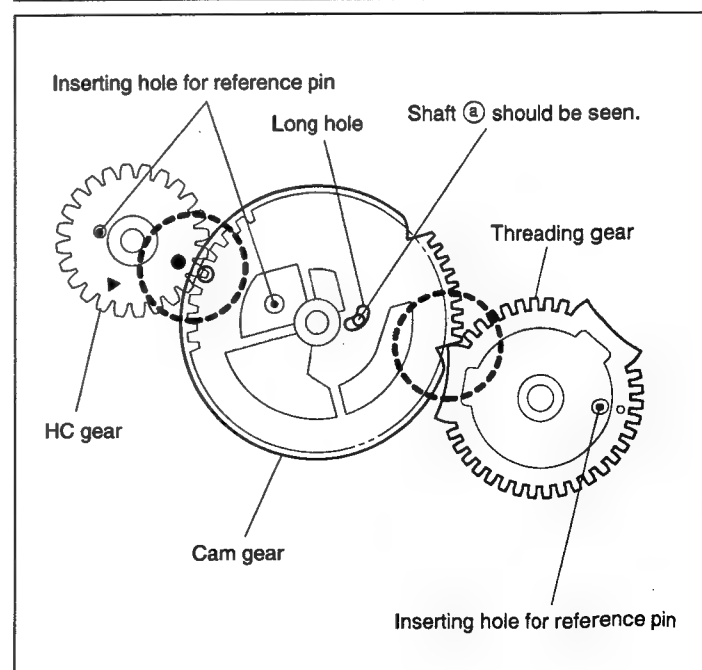
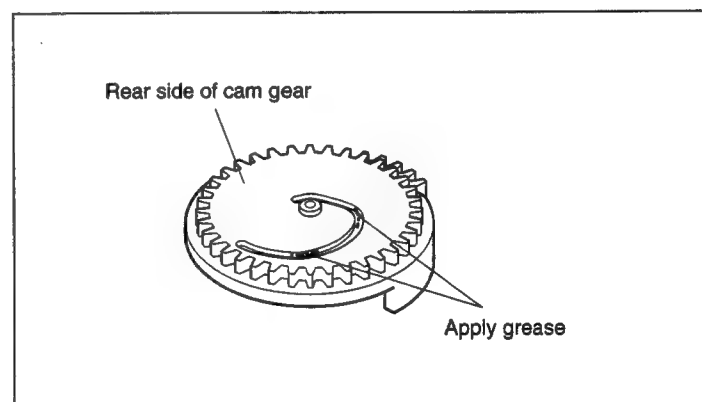
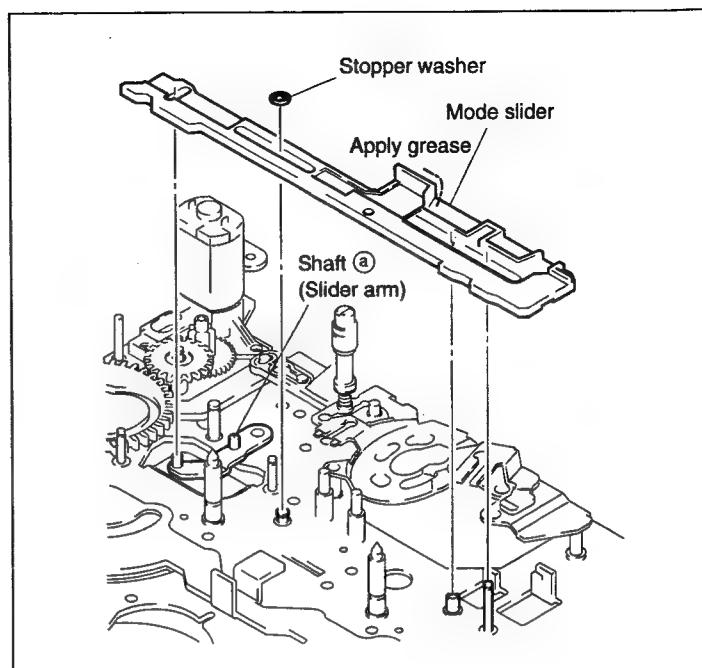
Note: When replacing the cam gear, apply grease on to the groove of rear side of the cam gear, then attach it.

22. Adjust the phase as follows.

- 1) When attaching the cam gear and threading gear, insert the reference pin into the hole of each gear shown in the figure, and adjust the phase.
- 2) At the same time, make sure that shaft (a) of the slider arm should be seen from the long hole of the cam gear.

Adjustment

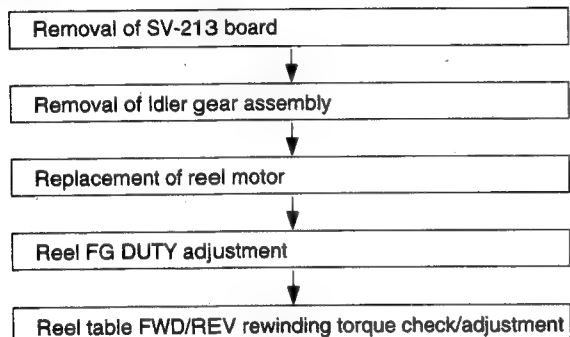
23. Perform the tape guide height check/adjustment. (Refer to Section 7-37.)
24. Perform the capstan FG DUTY adjustment at Menu M601. (Refer to Section 11-2-1.)
25. Perform the REV rewinding torque check/adjustment. (Refer to Section 7-38.)
26. Perform the TR arm assembly position check/adjustment. (Refer to Section 7-40.)
27. Perform the FWD back tension check/adjustment. (Refer to Section 7-39.)
28. Perform the tracking adjustment. (Refer to Section 8-3.)
29. Perform the check after tracking adjustment. (Refer to Section 8-4.)
30. Perform the check of self-recording tape playback. (Refer to Section 8-5.)
31. Perform the switching position adjustment. (Refer to Section 8-8.)



7-30. REPLACEMENT OF REEL MOTOR

Reel table position: Standard cassette position
Mode: Unthreading end

Replacement Flowchart



Removal

1. Remove the SV-213 board.
(Refer to Section 3-9-8.)
2. Remove the idler gear assembly.
(Refer to Section 7-26.)
3. Remove the three screws, and remove the reel motor.

Note: When the reel motor is removed, the washer shown in the figure will also be removed with it. Be careful not to lose the washer.

Attachment

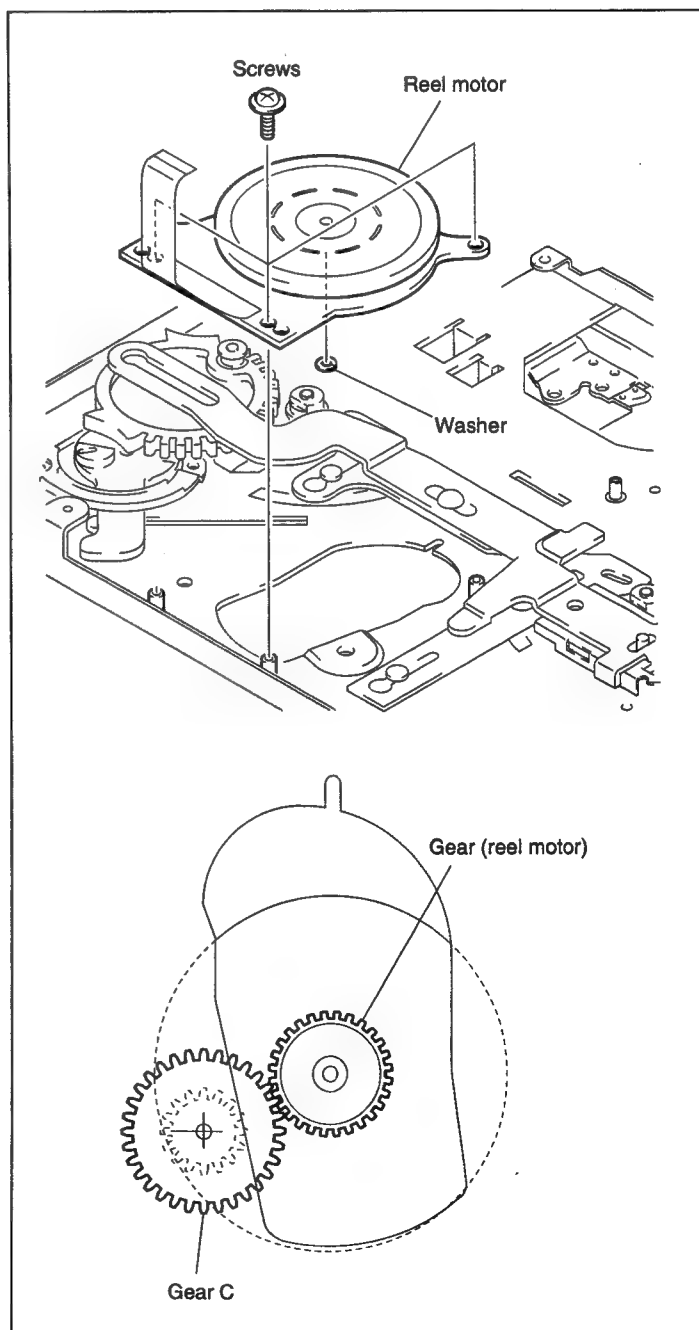
4. Attach the new reel motor in the reverse order of step 3.

Note: After attaching, check that the gear of the reel motor shown in the figure and gear C are engaged.

5. Attach the parts removed in the reverse order of steps 1 to 3.

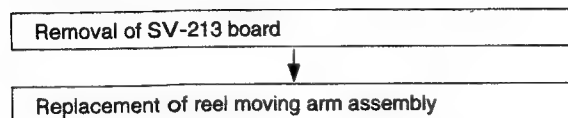
Check/Adjustment

6. Perform the reel FG DUTY adjustment at Menu M607. (Refer to Section 11-2-2.)
7. Perform reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)



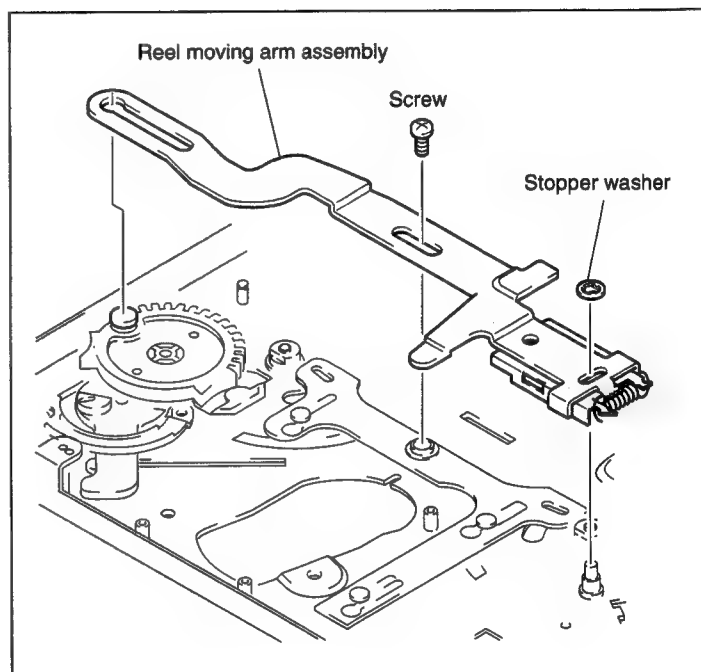
7-31. REPLACEMENT OF REEL MOVING ARM ASSEMBLY

Replacement Flowchart



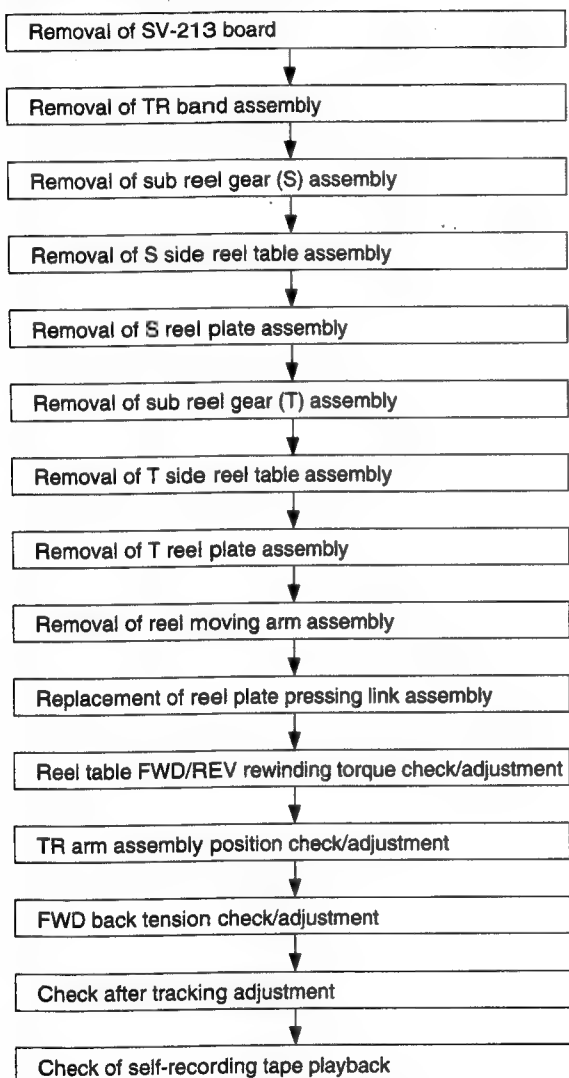
Removal/Attachment

1. Remove the SV-213 board.
(Refer to Section 3-9-8.)
2. Remove the screw and stopper washer shown in the figure, and remove the reel moving arm assembly.
3. Attach the new reel moving arm assembly in the reverse order of step 2.
4. Attach the parts removed in the reverse order of step 1.



7-32. REPLACEMENT OF REEL PLATE PRESSING LINK ASSEMBLY

Replacement Flowchart



Removal

1. Remove the SV-213 board. (Refer to Section 3-9-8.)
2. Remove the TR band assembly. (Refer to Section 7-12.)
3. Remove the sub reel gear (S) assembly.
(Refer to Section 7-10.)
4. Remove the S side reel table assembly. (Refer to Section 7-4.)
5. Remove the S reel plate assembly. (Refer to Section 7-19.)
6. Remove the sub reel gear (T) assembly.
(Refer to Section 7-11.)
7. Remove the T side reel table assembly. (Refer to Section 7-5.)
8. Remove the T reel plate assembly. (Refer to Section 7-20.)
9. Remove the reel moving arm assembly.
(Refer to Section 7-31.)

10. Remove the reel plate pressing link assembly from the shaft (at three parts) in the arrow direction as shown in the figure.

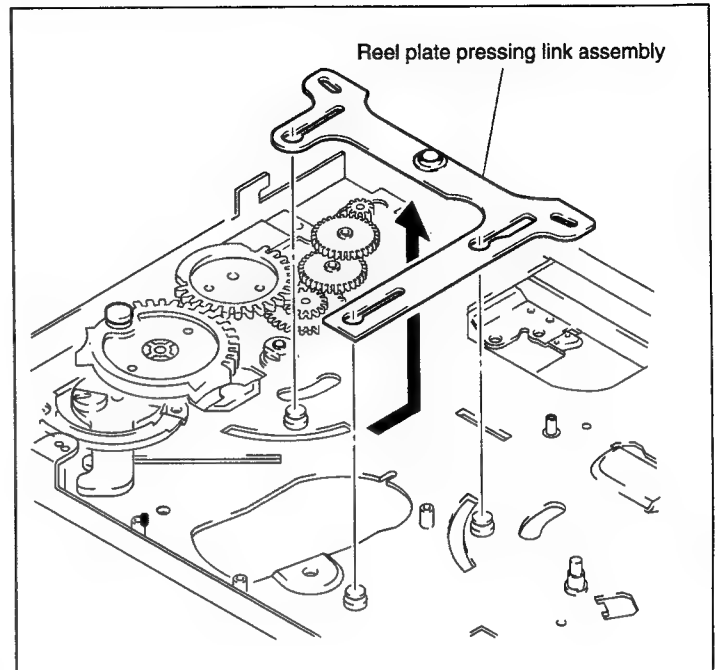
Attachment

11. Attach the new reel plate pressing link assembly in the reverse order of step 10.
12. Attach the parts removed in the reverse order of steps 1 to 11.

Note: When attaching the parts, make sure that the S side reel table assembly and T side reel table assembly, and the sub reel gear (S) assembly and sub reel gear (T) assembly are not mixed up with each other.

Check/Adjustment

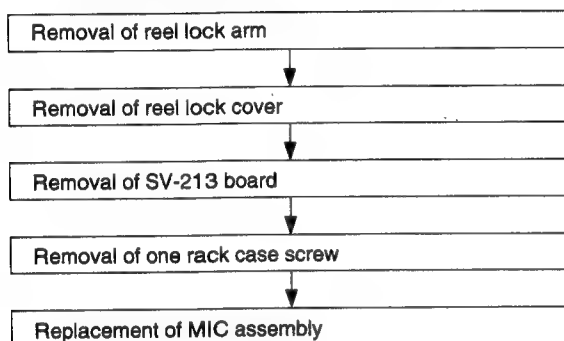
13. Perform the reel table FWD/REV rewinding torque check/adjustment. (Refer to Section 7-38.)
14. Perform the TR arm assembly position check/adjustment. (Refer to Section 7-40.)
15. Perform the FWD back tension check/adjustment. (Refer to Section 7-39.)
16. Perform the check after tracking adjustment. (Refer to Section 8-4.)
17. Perform the check of self-recording tape playback. (Refer to Section 8-5.)



7-33. REPLACEMENT OF MIC ASSEMBLY

Reel table position: Center of the standard cassette position and mini cassette position

Replacement Flowchart



Removal

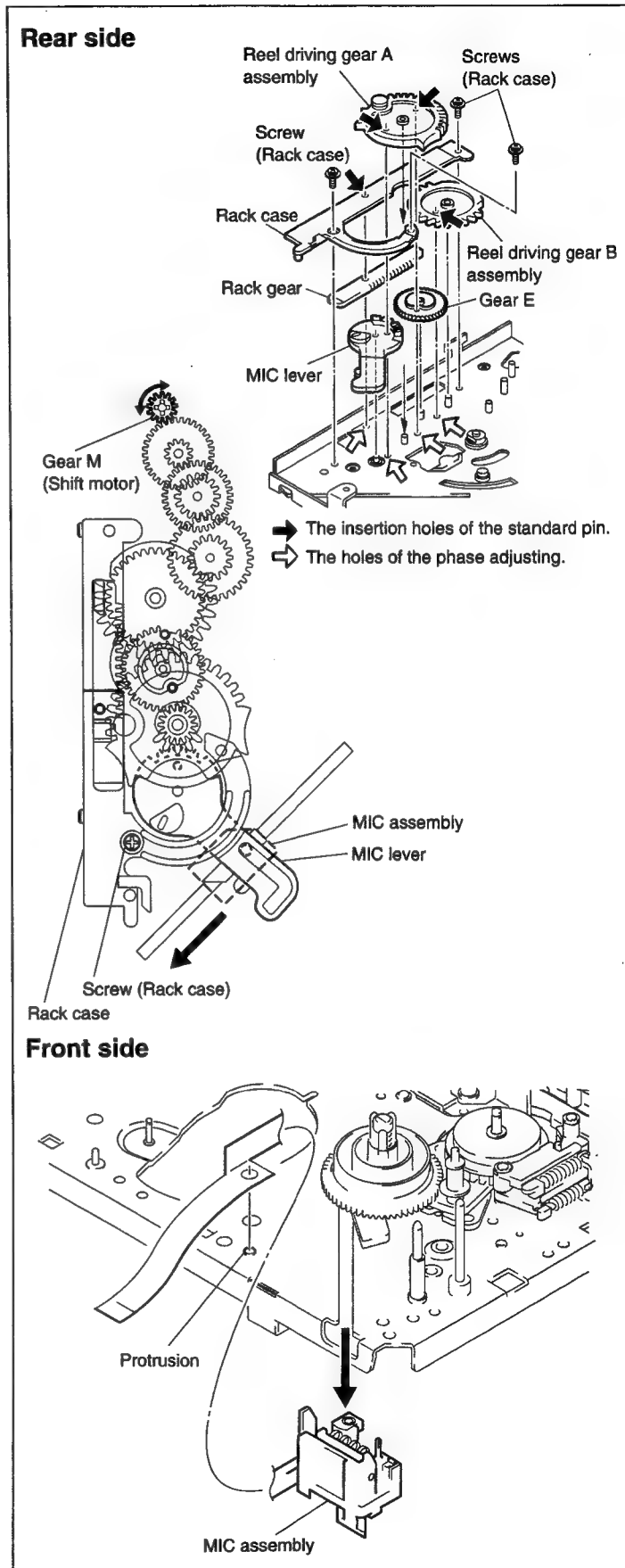
1. Remove the reel lock arm.
(Refer to Section 7-26.)
2. Remove the reel lock cover.
(Refer to Section 7-26.)
3. Remove the SV-213 board.
(Refer to Section 3-9-8.)
4. Rotate gear M of the shift motor, and move the MIC lever to the position shown in the figure.
5. Remove the screw of the rack case.
6. Lift up the MIC lever slightly, rotate the MIC assembly in the arrow direction and slide it, then further lift up the rack case slightly and remove it.

Attachment

7. Attach the MIC assembly in the reverse order of steps 4 to 6.
8. Attach the parts removed in the reverse order of steps 1 to 3.

Check

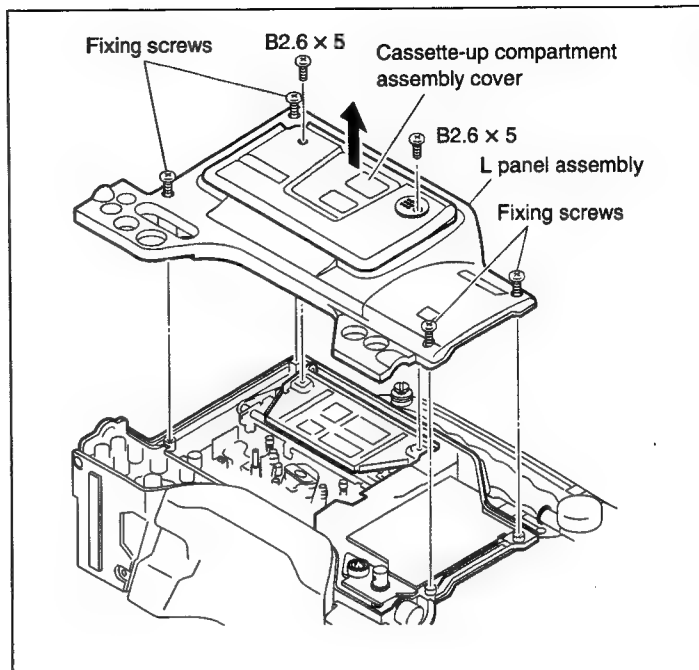
9. After replacing, perform the phase check of each gear as follows.
 - Insert the reference pin into the gear hole shown in the figure, and check that it goes into the hole on the chassis.



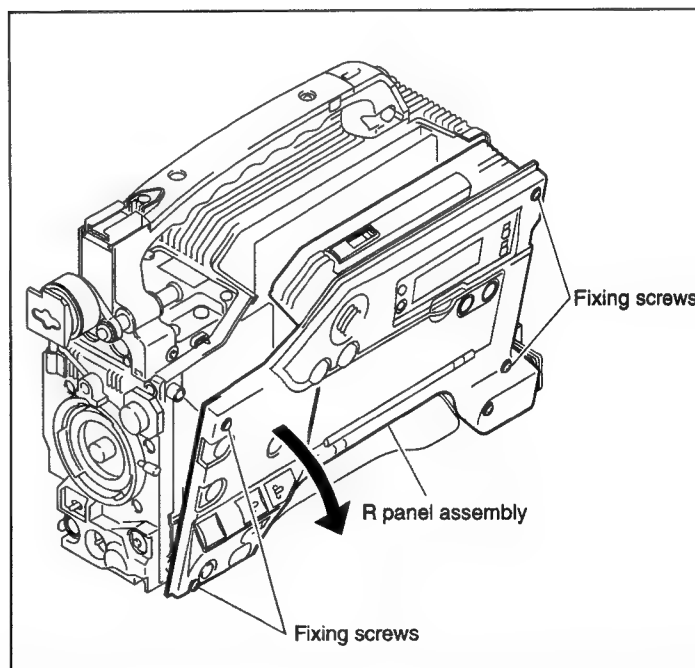
7-34. REPLACEMENT OF CCD UNIT

Removal

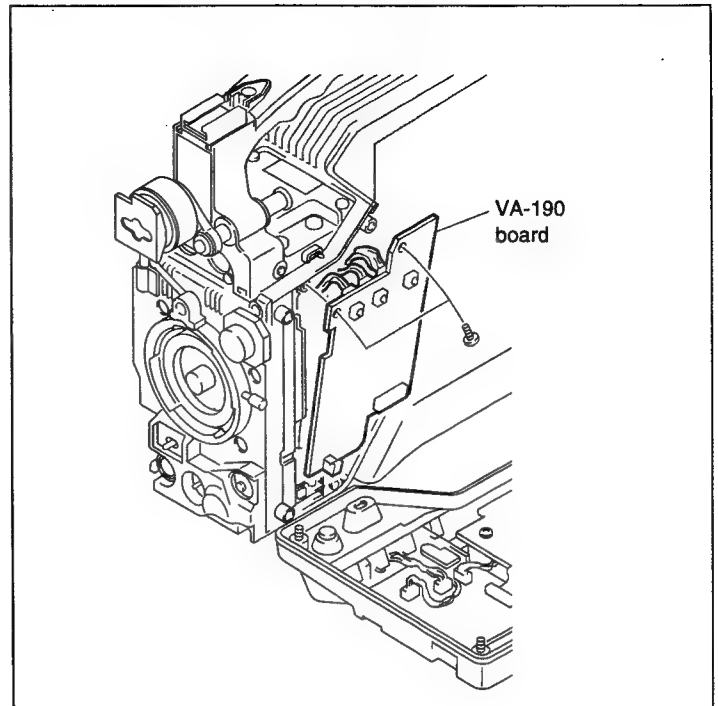
1. Remove the four screws of the L panel assembly and remove the two screws of the Cassette-up compartment assembly cover which is part of the L panel assembly.



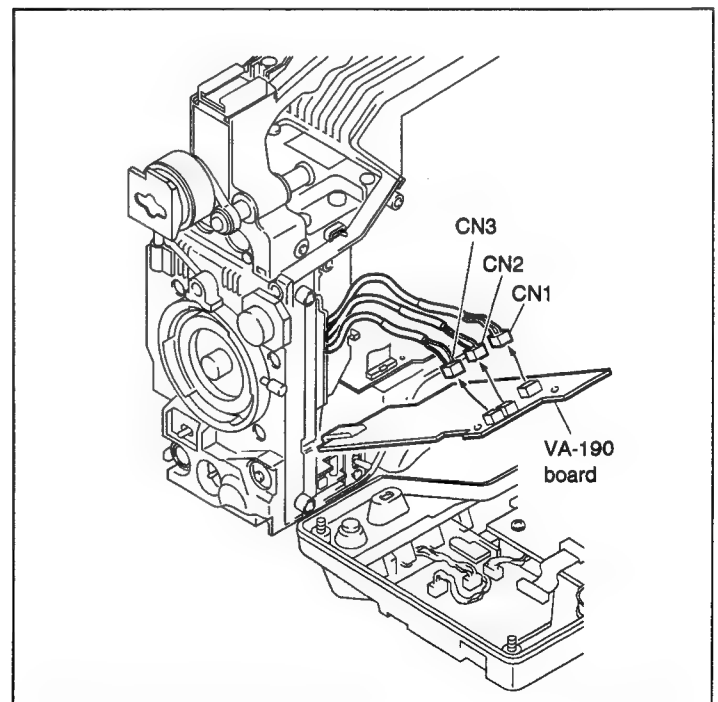
2. Remove the four screws of the R panel assembly.



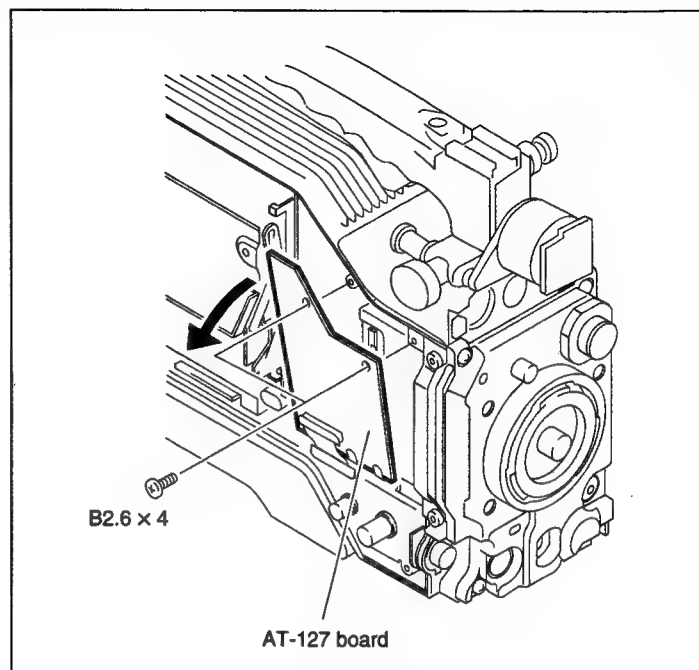
3. Remove the two screws of the VA-190 board.



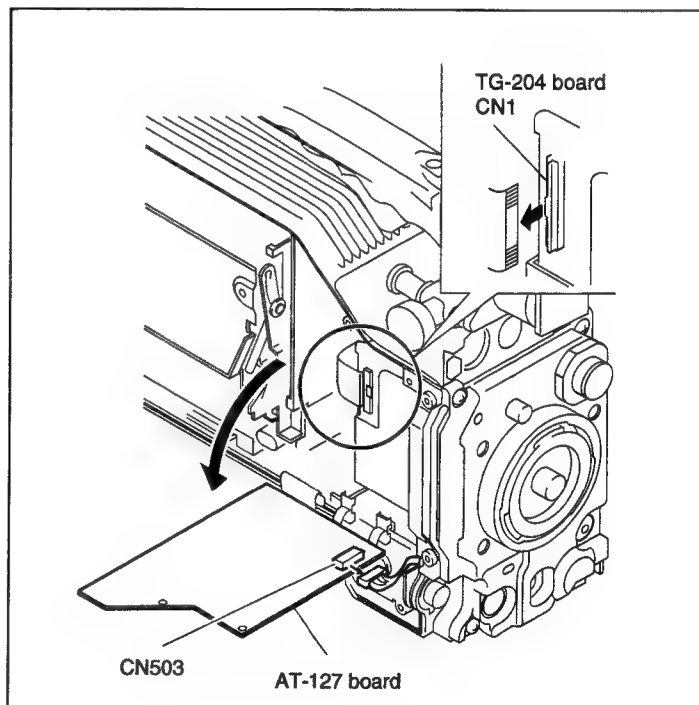
4. Disconnect the connectors CN1, CN2 and CN3 on the VA-190 board.



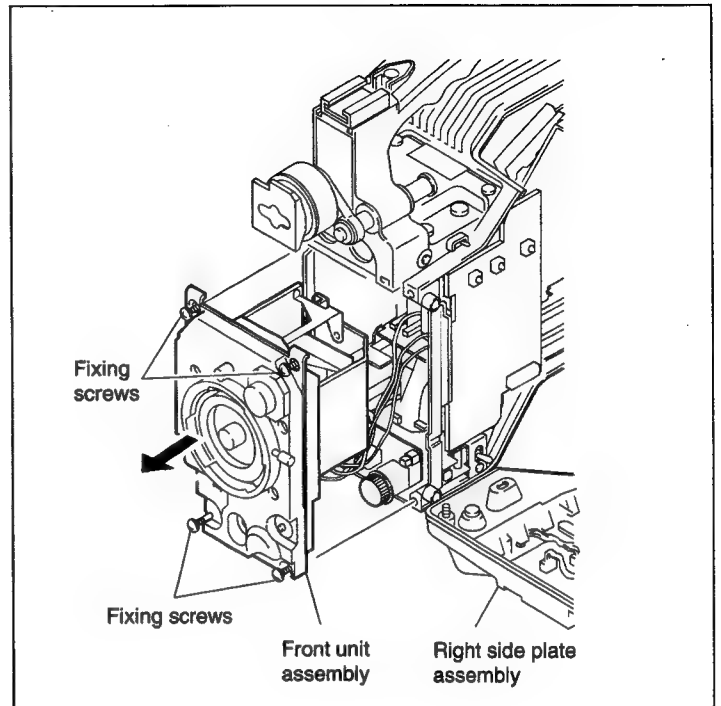
5. Remove the two screws of the AT-127 board.



6. Disconnect the connector CN1 on the TG-204 board and the connector CN503 or the AT-127 board.



7. Remove the four screws of the Front unit assembly and pull out the Front unit assembly carefully in the arrow direction.



8. Remove the setscrew (3 × 4) to remove the filter knob.
9. Remove the four screws (B3 × 8) and spring washers, and remove the CCD unit from the Front unit assembly.

Note: When handling the CCD unit, pay attention not to stress each PA board.

10. First remove the holder for transportation from the replacement CCD unit. Then replace the defective CCD unit with it.

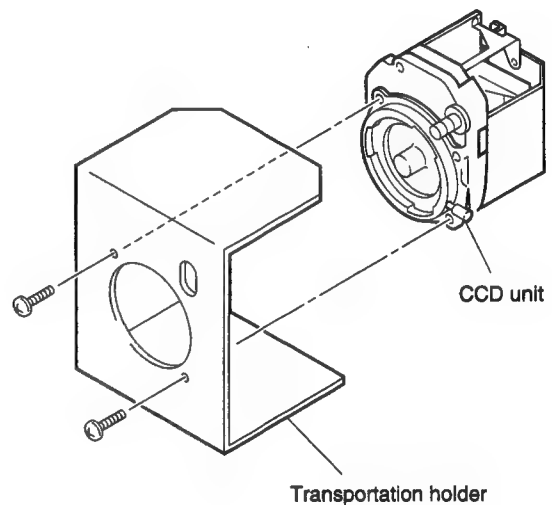
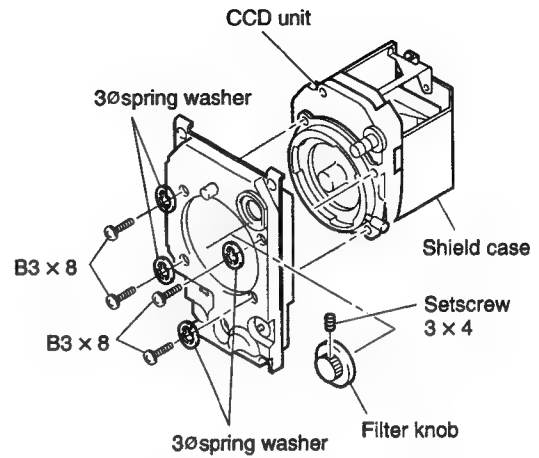
Note: Re-use the holder for shipping back the replacement unit.

Attachment

11. Assemble in the reverse order of removal.

Adjustment

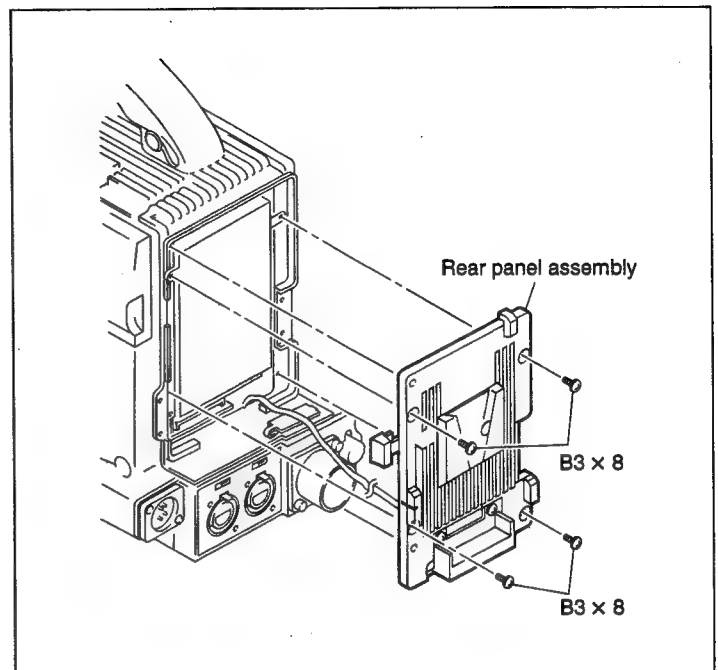
12. After the replacement is completed, perform several adjustments referring to Section 10-1-4. Note on Adjustment.
In addition, perform MEMORY BACK UP referring to Service menu "Page 21" in Section 5-2-3.



7-35. REPLACEMENT OF DC-DC CONVERTER

Removal

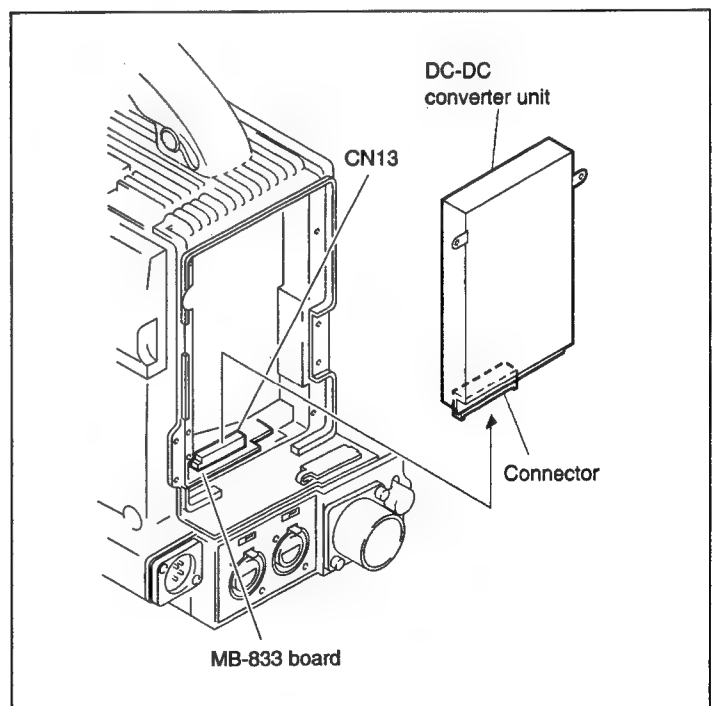
1. Remove the four screws of the Rear panel assembly.



2. Pull out the CN13 connector of the MB-833 board from the DC-DC converter in the arrow direction.

Attachment

3. Attach a new parts in the reverse order of steps 1 and 2.



ADJUSTMENTS AFTER REPLACEMENT OF MAIN PARTS

7-36. S REEL TABLE, T REEL TABLE HEIGHT CHECK/ADJUSTMENT

Reel table position: Standard cassette position

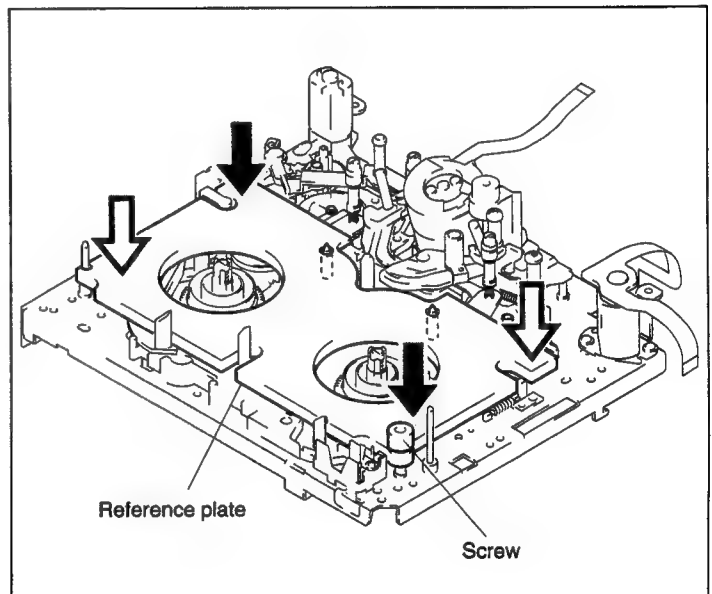
- Tools

Reference plate: J-6442-410-A

Reel table gauge: J-6442-430-A

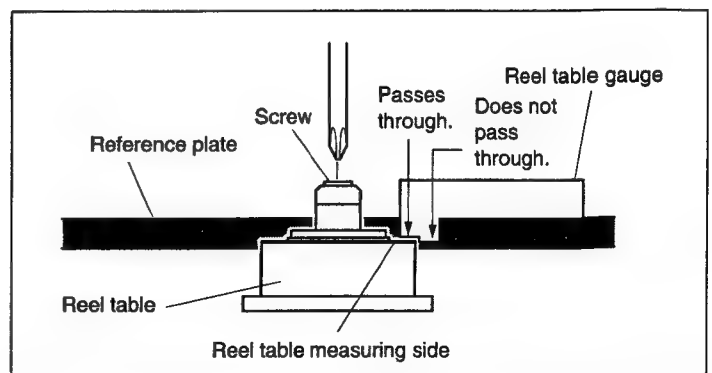
- Perform the reel table height check/adjustment in the same way for the S reel table and T reel table.
- Perform with the cassette compartment removed.
(Refer to Section 7-2.)

1. Place the reference plate onto the mechanical deck, press the four corners of the reference plate with your finger on the diagonal lines respectively as shown in the figure, and check that it does not shake. If it shakes, rotate the screw on the reference plate, and adjust so that it does not shake.



2. Push the reel table gauge against the reel table lightly as shown in the figure, and check that the tip of the gauge passes through the top part, but not the bottom. If this is not satisfied, rotate the screw of the reel table shown in the figure, and adjust.

Note: When adjusting the reel table, do not rotate the screw counterclockwise. Rotate it clockwise only. If rotated counterclockwise a reel table must be replaced.



7-37. GUIDE HEIGHT CHECK/ ADJUSTMENT

Reel table position: Standard cassette position

Mode: Threading end

- Tools

Reference plate: J-6442-410-A

Guide gauge: J-6442-420-A

Tape guide adjustment screwdriver:

J-6082-362-A

Three bond 1401B (screw-locking compound):

7-432-114-11

- Remove the cassette compartment.

(Refer to Section 7-2.)

The following describes the method for performing the height check/adjustment of each guide.

- TG-1 guide

(Adjust the guide height with the upper flange.)

- TG-2 guide

(Adjust the guide height with the lower flange.)

- TG-3 guide

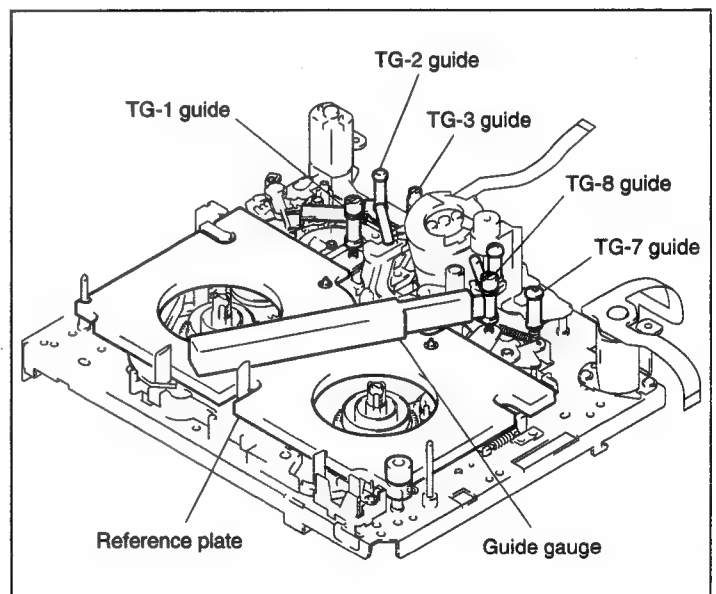
(Adjust the guide height with the upper flange.)

- TG-7 guide

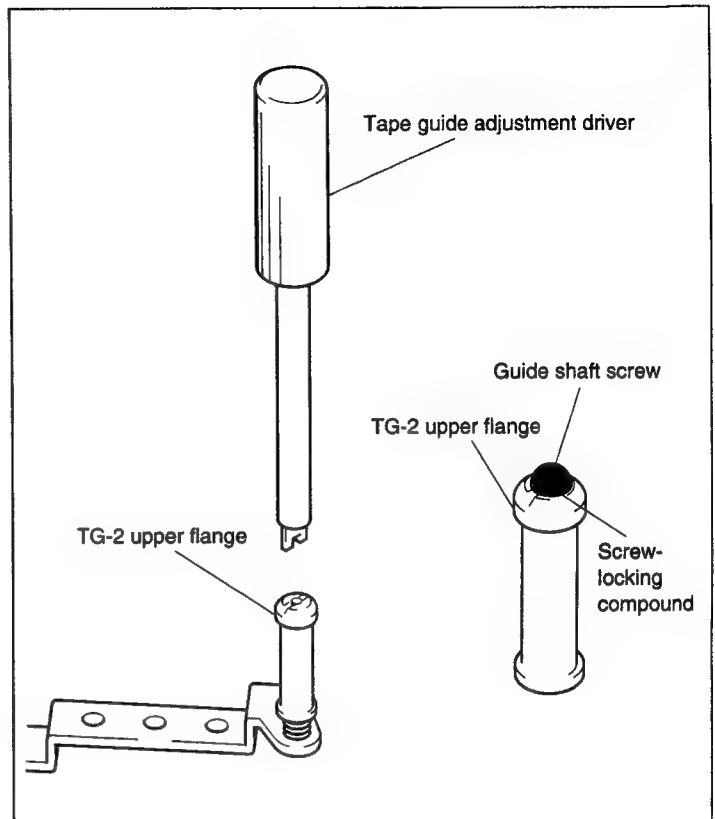
(Adjust the guide height with the upper flange.)

- TG-8 guide

(Adjust the guide height with the upper flange.)

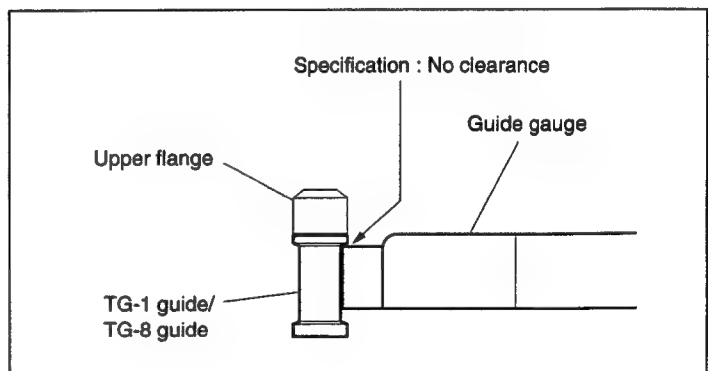


- Use the service tool tape guide adjustment screwdriver to adjust the height of the tape guides.
- After adjusting the tape guide height, apply screw-locking compound (Three bond 1401B) to the screw of the upper flange of the tape guides.



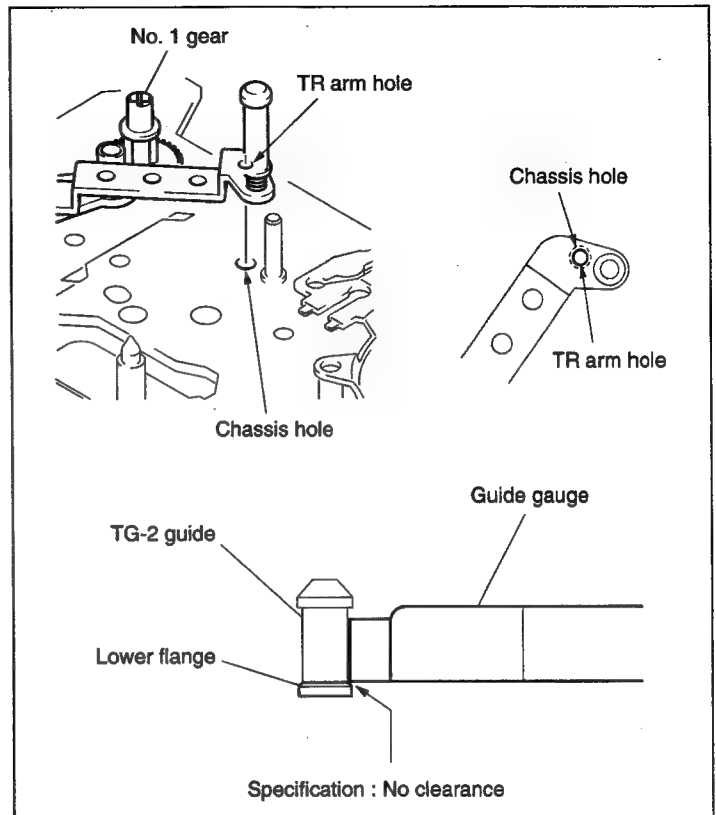
[TG-1, TG-8 Guide]

1. Place the reference plate on the mechanical deck.
(Refer to Section 7-36. step 1.)
2. Place the guide gauge on the reference plate, push it to the guide lightly, and check that there is no clearance between the guide gauge and the upper flange.
If this is not satisfied, rotate the flange and adjust.



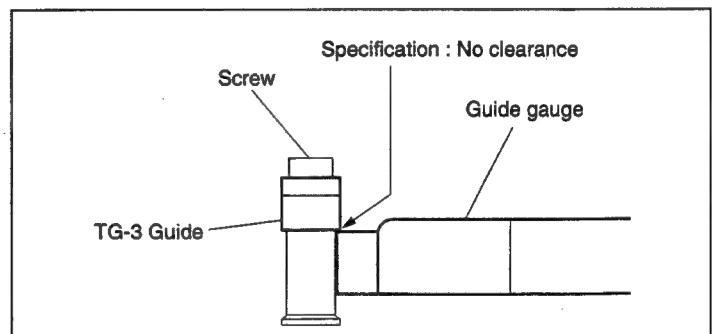
[TG-2 Guide]

1. Place the reference plate on the mechanical deck.
(Refer to Section 7-36. step 1.)
2. Rotate the No.1 gear so that the TR arm hole and chassis hole shown in the figure are at the same position when seen from above.
3. Place the guide gauge on the reference plate, push it to the guide lightly, and check that there is no clearance between the guide gauge and the lower flange.
If this is not satisfied, rotate the flange and adjust.



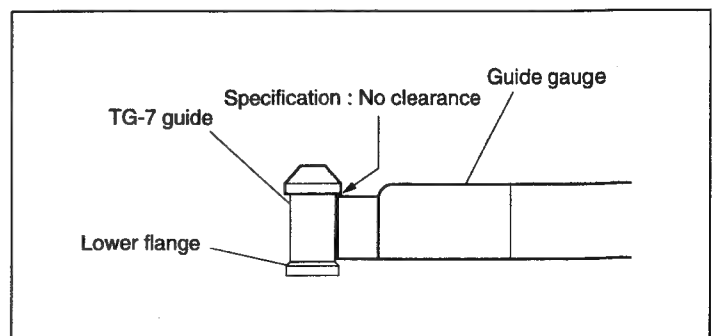
[TG-3 Guide]

1. Place the reference plate on the mechanical deck.
(Refer to Section 7-36. step 1.)
2. Place the guide gauge on the reference plate, push it to the guide lightly, and check that there is no clearance between the guide gauge and the upper flange.
If this is not satisfied, rotate the screw shown in the figure and adjust.



[TG-7 Guide]

1. Place the reference plate on the mechanical deck.
(Refer to Section 7-36. step 1.)
2. Place the guide gauge on the reference plate, push it to the guide lightly, and check that there is no clearance between the guide gauge and the upper flange.
If this is not satisfied, rotate the flange and adjust.



7-38. REEL TABLE FWD/REV REWINDING TORQUE CHECK/ ADJUSTMENT

Reel table position: Standard cassette position

- Tools

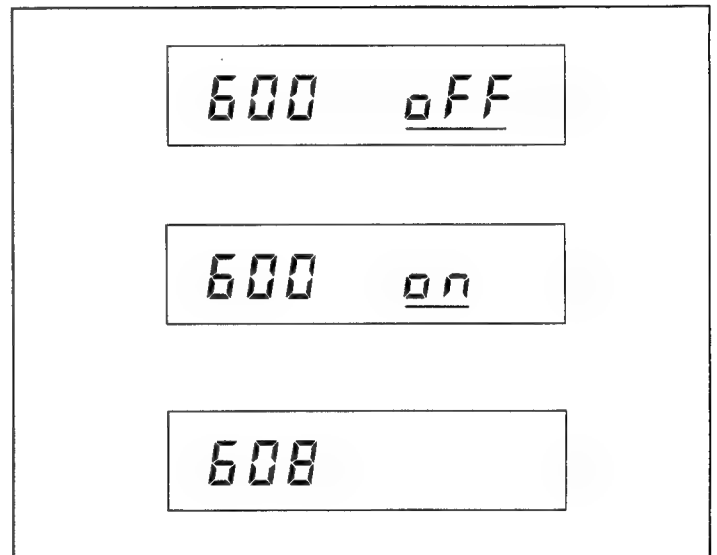
Torque gauge (90ATG): J-6442-510-A

Rewinding torque measuring attachment:

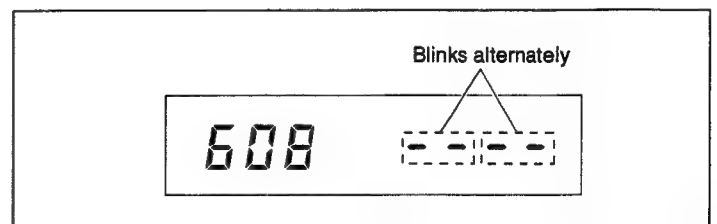
J-6442-520-A

Torque cassette: J-6082-373-A

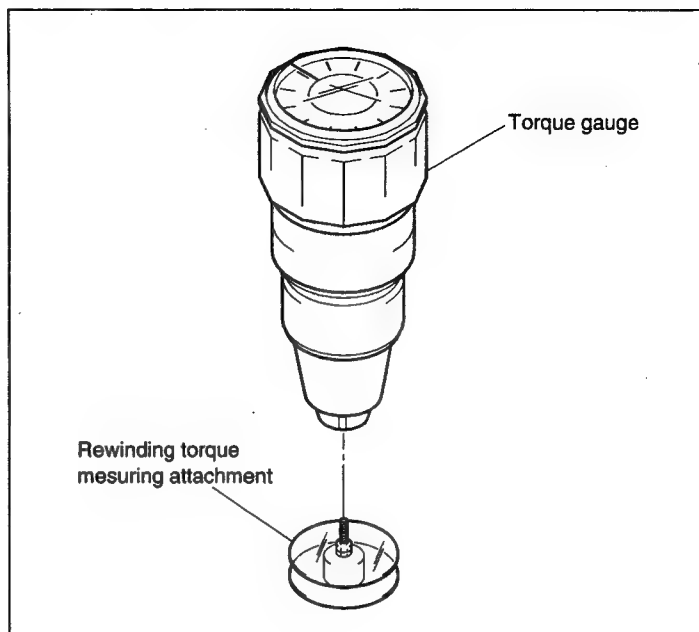
1. Remove the cassette compartment.
(Refer to Section 7-2.)
2. While pressing the SHIFT button inside the TC panel, press the MENU button.
3. While pressing MENU button, release the SHIFT button. Check that "600 oFF" is displayed about 1 second later, and release the MENU button.
(Displayed characters underlined in the following description indicate that they are blinking.)
4. Press the RESET (MENU SET) button once to blink "oFF."
5. Press the ADVANCE button once and select "on." (on and oFF are repeated each time the ADVANCE button is pressed.)
6. Press the RESET (MENU SET) button once.
7. Press the ADVANCE button or SHIFT button to display Menu No. 608.



8. Press the RESET (MENU SET) button.
Check that the parts displayed on the display window blink alternately as shown in the figure.



9. Set the rewinding torque measuring attachment to the torque gauge (90ATG) as shown in the figure as shown in the figure.



10. Place the torque gauge on the T reel table, press the STOP key, and rotate the reel table to the FWD side.
11. Adjust the torque gauge pointer to "0" and check that the torque gauge value satisfies the specification.

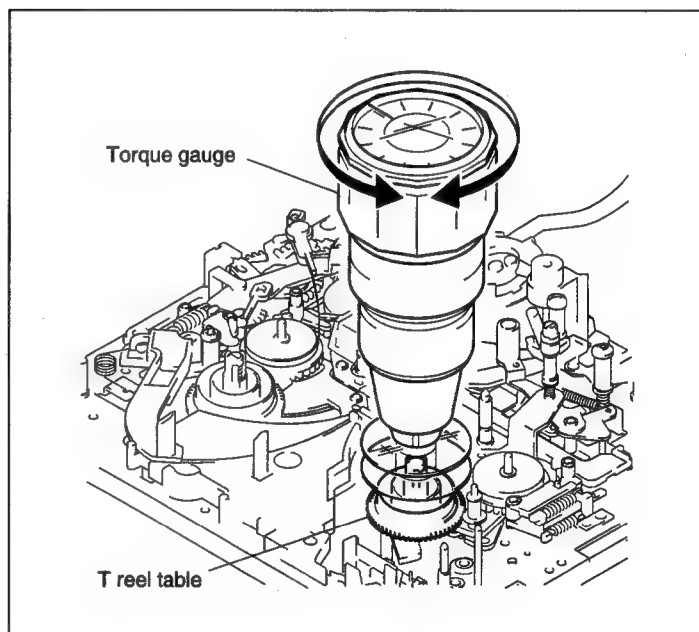
Specification:

FWD rewinding torque: $0.0052 \pm 0.0002 \text{ N}\cdot\text{m}$
($52 \pm 2 \text{ g}\cdot\text{cm}$)

If it does not, perform the following adjustment.

- When the torque value is towards the + side:
Press the REW key and adjust so that the torque value is within the specification.
- When the torque value is towards the - side:
Press the FF key and adjust so that the torque value is within the specification.

12. Press the STOP key, and stop the reel table from rotating.



13. Place the torque gauge on the S reel table, press the STOP key, and rotate the reel table towards the REV side.
14. Adjust the torque gauge pointer to "0" and check that the torque gauge value satisfies the specification.

Specification:

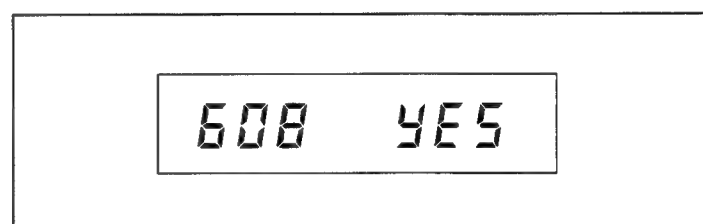
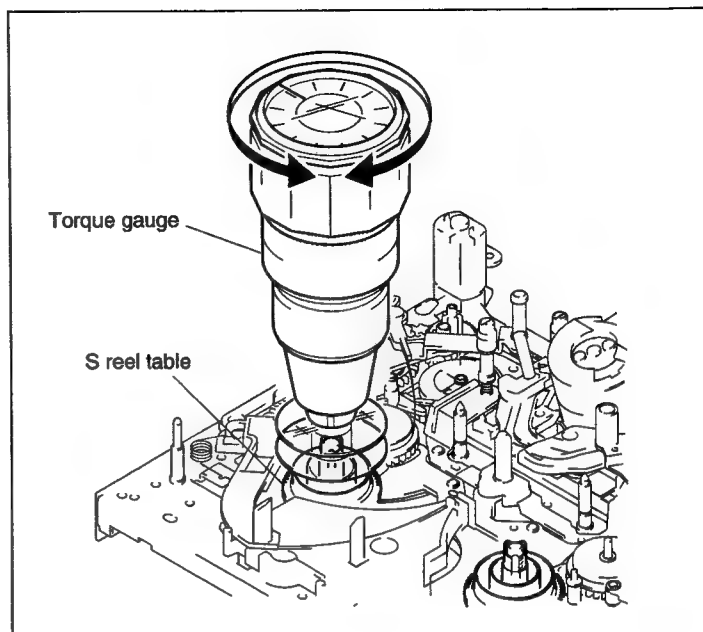
REV rewinding torque: $0.0052 \pm 0.0002 \text{ N}\cdot\text{m}$
 $(52 \pm 2 \text{ g}\cdot\text{cm})$

If it does not, perform the following adjustment.

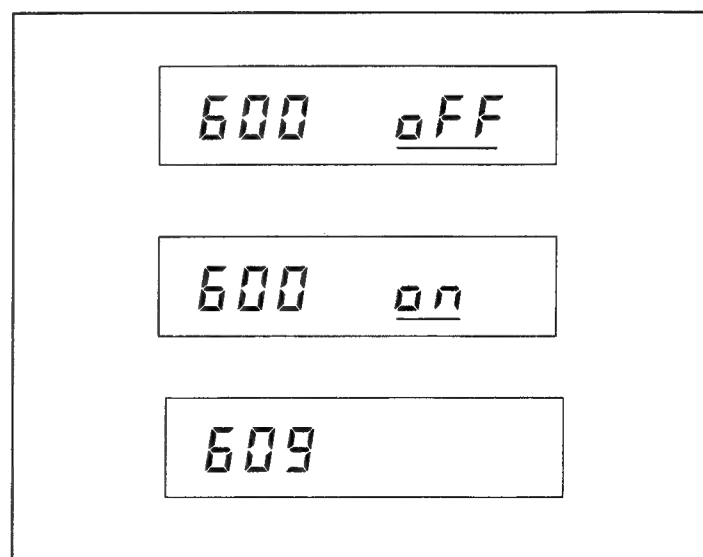
- When the torque value is towards the + side:
Press the REW key and adjust so that the torque value is within the specification.
- When the torque value is towards the – side:
Press the FF key and adjust so that the torque value is within the specification.

15. Press the STOP key, and stop the reel table from rotating.

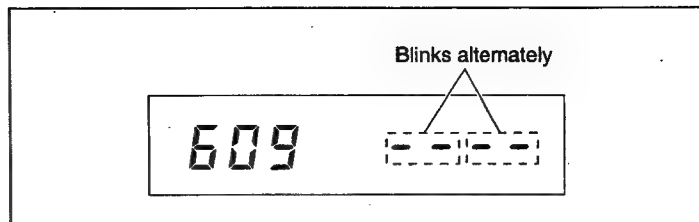
16. After removing the torque gauge, press the EJECT key, and check that the display windows is as shown in the figure.
17. Attach the cassette compartment.
(Refer to Section 7-2.)



18. While pressing the SHIFT button inside the TC panel, press the MENU button.
19. While pressing MENU button, release the SHIFT button. Check that "600 oFF" is displayed about 1 second later, and release the MENU button.
(Displayed characters underlined in the following description indicate that they are blinking.)
20. Press the RESET (MENU SET) button once to blink "oFF."
21. Press the ADVANCE button once and select "on." (on and oFF are repeated each time the ADVANCE button is pressed.)
22. Press the RESET (MENU SET) button once.
23. Press the ADVANCE button or SHIFT button to display Menu No. 609.



24. Press the RESET (MENU SET) button.
Check that the parts displayed on the display window blink alternately as shown in the figure.
25. Insert the torque cassette, and check that the STOP mode is set.



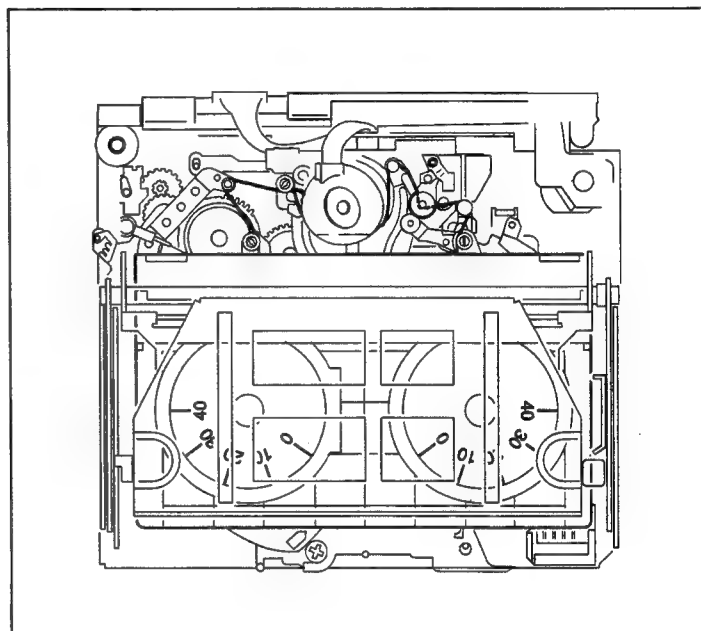
26. Press the STOP key, and check that the torque cassette value of the FWD tape path satisfies the specification.

Specification:

FWD rewinding torque: $0.0010 \pm 0.0001 \text{ N}\cdot\text{m}$
($10 \pm 1 \text{ g}\cdot\text{cm}$)

If it does not, perform the following adjustment.

- When the torque value is towards the + side:
Press the REW key and adjust so that the torque value is within the specification.
- When the torque value is towards the – side:
Press the FF key and adjust so that the torque value is within the specification.



27. Press the STOP key, and check that the torque cassette value of the REV tape path satisfies the specification.

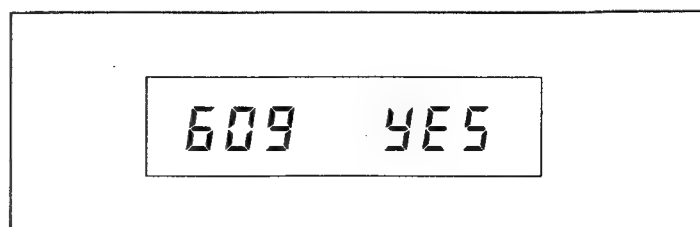
Specification:

REV rewinding torque: $0.0010 \pm 0.0001 \text{ N}\cdot\text{m}$
($10 \pm 1 \text{ g}\cdot\text{cm}$)

If it does not, perform the following adjustment.

- When the torque value is towards the + side:
Press the REW key and adjust so that the torque value is within the specification.
- When the torque value is towards the – side:
Press the FF key and adjust so that the torque value is within the specification.

28. Press the EJECT key, and remove the torque cassette.
29. Check that the display window is as shown in the figure.



7-39. FWD BACK TENSION CHECK/ ADJUSTMENT

Reel table position: Standard cassette position
Mode: PLAY

• Tool:

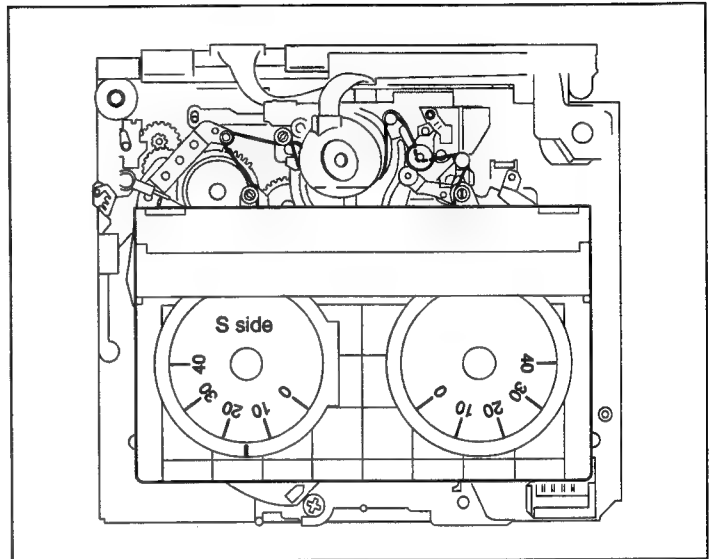
Torque cassette: J-6082-373-A

1. Remove the cassette compartment.
(Refer to Section 7-2.)
2. Set the torque cassette.
3. Hold the torque cassette gently so that it does not rise, run the tape, and check that the FWD back tension torque value (S side) satisfies the specification.

Specification

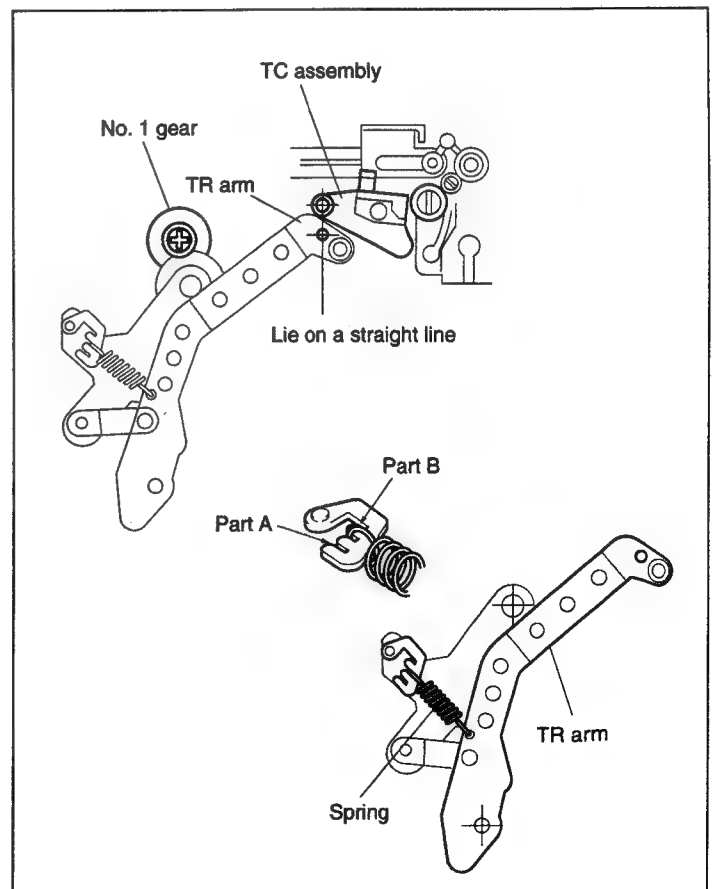
FWD back tension torque:

0.0011 to 0.00145 N·m
(11 to 14.5 g·cm)



If it does not, perform the following adjustment.

- 1) Press the EJECT key, and remove the tape.
 - 2) Rotate the No. 1 gear, load the TR arm, and adjust so that the TR arm hole and TC assembly shaft hole shown in the figure lie on a straight line.
- When the torque value is towards the + side:
Re-hook the spring at part A.
 - When the torque value is towards the - side:
Re-hook the spring at part B.
4. Perform step 3 again, and check that the torque value satisfies the specification.



7-40. TR ARM ASSEMBLY POSITION CHECK/ADJUSTMENT

Reel table position: Mini cassette position

Mode: PLAY

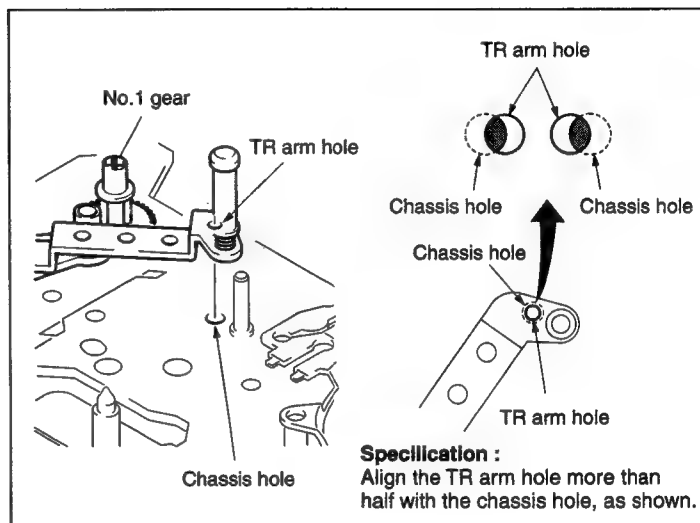
- Tool

Mini cassette tape (commercial product)

1. Run the mini cassette tape (commercial product), and check that the TR arm hole should be aligned more than half with the chassis hole, as shown.

Specification:

The TR arm hole should be inside the chassis hole during PLAY mode.

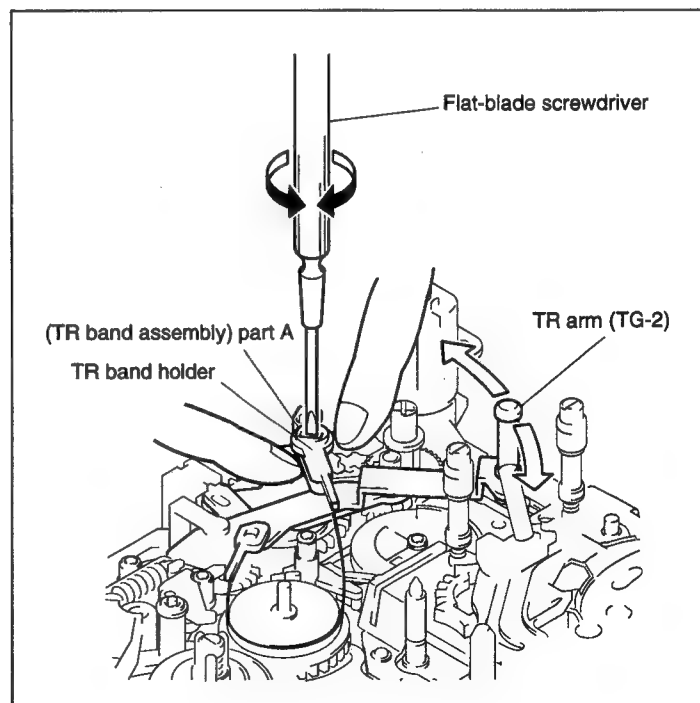


If it is not, perform the following adjustment.

- Insert a flat-blade screwdriver into part A of the TR band assembly shown in the figure, rotate it in the clockwise or counterclockwise directions to adjust it.

Note 1: When performing the adjustment, hold the TR band holder so that it does not rotate.

Note 2: Never touch the tape.



SECTION 8

TAPE PATH ALIGNMENT

8-1. GENERAL INFORMATION FOR TAPE PATH ALIGNMENT

8-1-1. Equipment and Tools Used

- Oscilloscope (Tektronix 2445B or equivalent)
- Guide adjustment driver (SONY Part No. J-6082-362-A)
- Small adjustment mirror (SONY Part No. J-6080-710-A)
- RF extension tool (SONY Part No. J-6442-350-A)
- Alignment tape, XH2-1AST (for DSR-500WS/500WSP, SONY Part No. 8-967-999-02)
- Alignment tape, XH5-1A (for DSR-500WS, SONY Part No. 8-967-999-21)
- Alignment tape, XH5-1AP (for DSR-500WSP, SONY Part No. 8-967-999-25)
- Blanking tape (commercially available tape, SONY PDVM-40ME or equivalent)
- Three bond 1401B

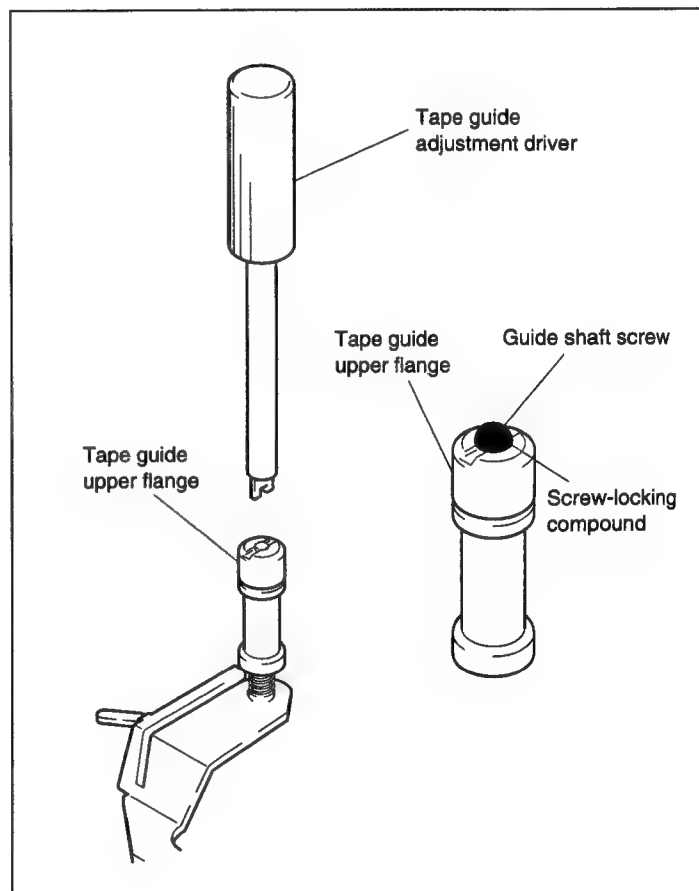
8-1-2. Tape Guide Adjustment Driver and Locking Screw

- (1) When performing the height adjustment of each tape guide, use the tape guide adjustment driver as a service tool.
- (2) Adjust the heights of TG-1, TG-2, TG-3, TG-7 and TG-8 guides, then apply a screw-locking compound to the locking screw of the upper flange of the tape guide.

	SONY Part No.
Tape guide adjustment driver	J-6082-362-A
Three Bond 1401B	7-432-114-11

Precaution on applying a screw-locking compound:

- Do not apply a screw-locking compound to a face which is in contact with tape.



8-1-3. Tape Path Adjustment Preparations

(1) Cassette Compartment

Attach the cassette compartment when performing tape path adjustments. This will enable adjustments to be performed more accurately.

(2) Cleaning

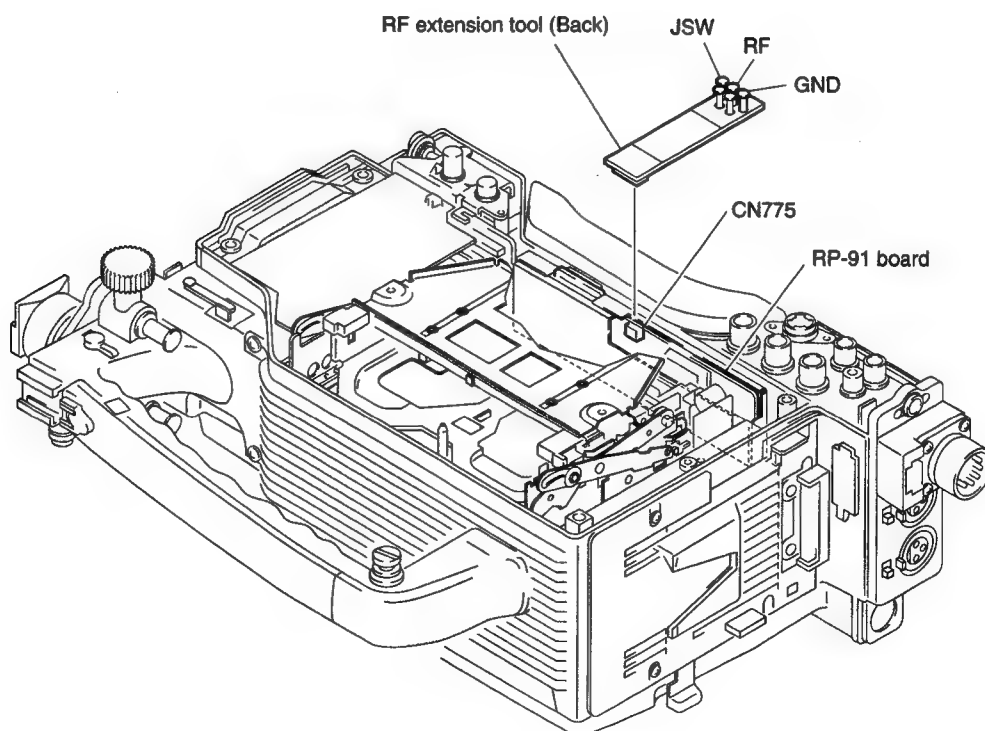
Clean faces that are in contact with tape. For how to clean them, refer to Section 6-4.

8-1-4. Connection

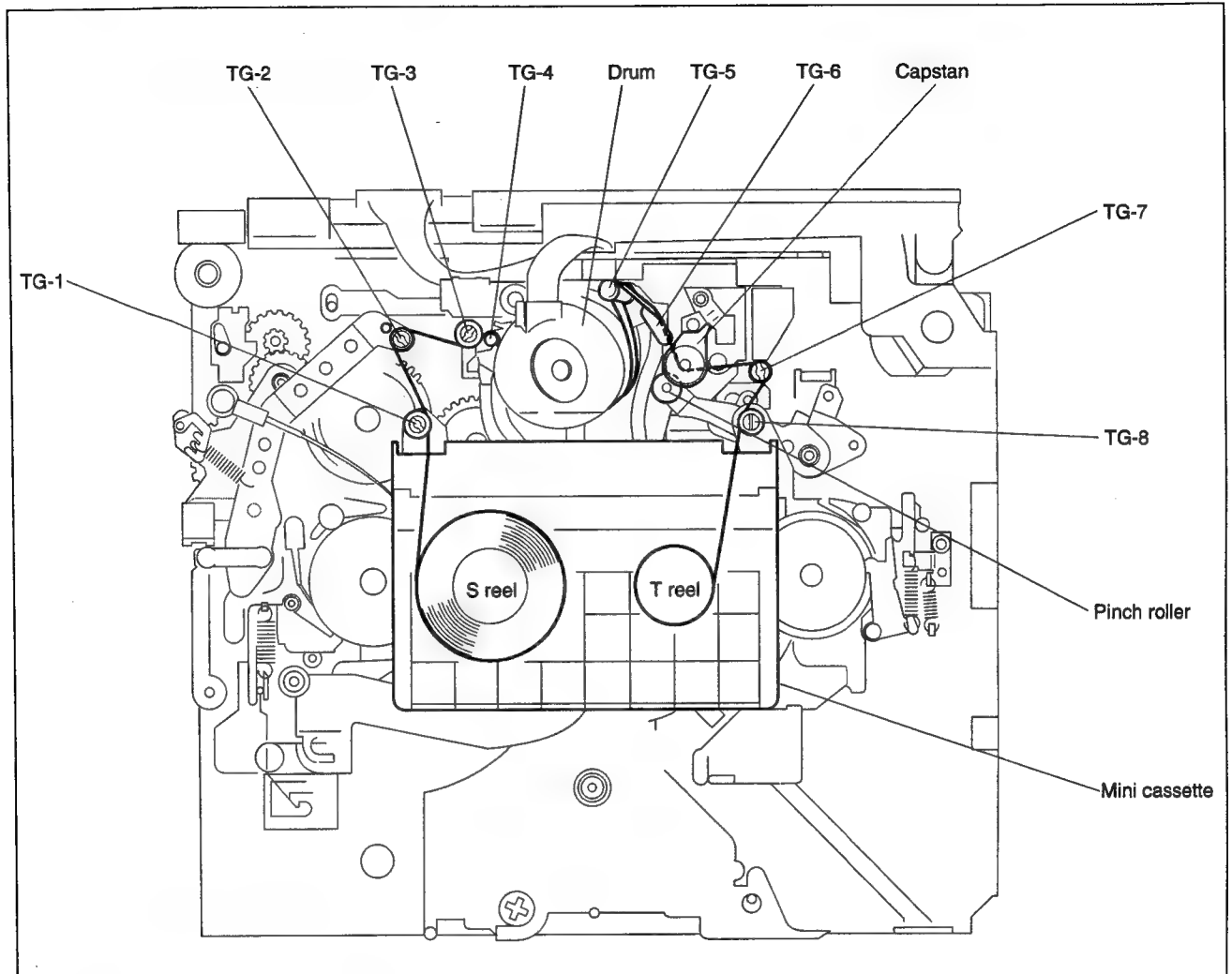
RF extension tool

Tool which can extract signals output from connector CN775 of the RP-91 board and can be connected easily to the probe.

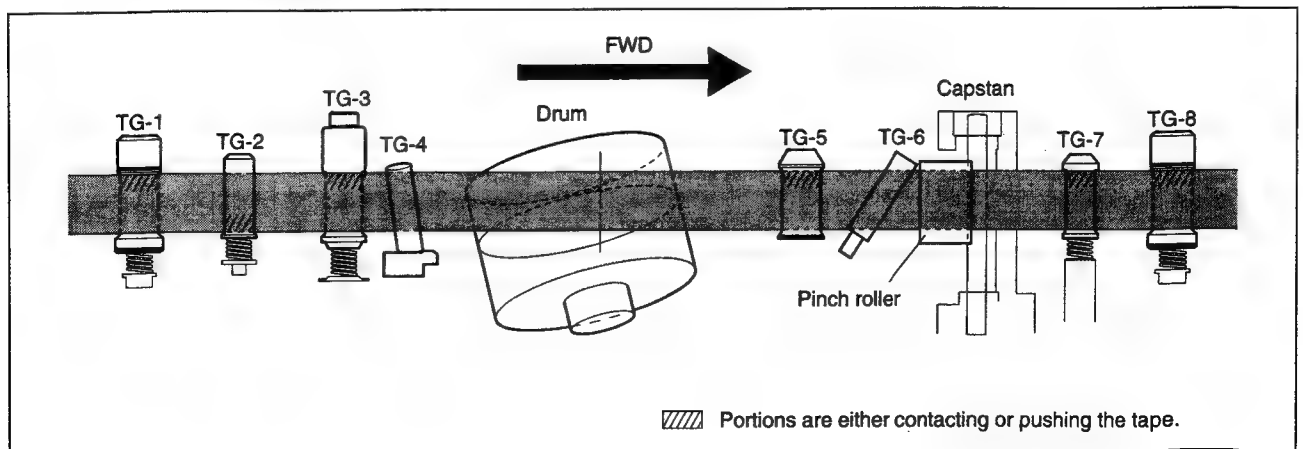
Insert the RF extension tool board into CN775 of the RP-91 board.



8-1-5. Drum and Tape Guide Positions



8-1-6. Tape Path State



8-2. SYSTEM SETTING MENU

The tape path system adjustment is performed by setting the following system setting menu.

No. 604 tracking adjustment:

Performs recording and playback in the central ITI mode.

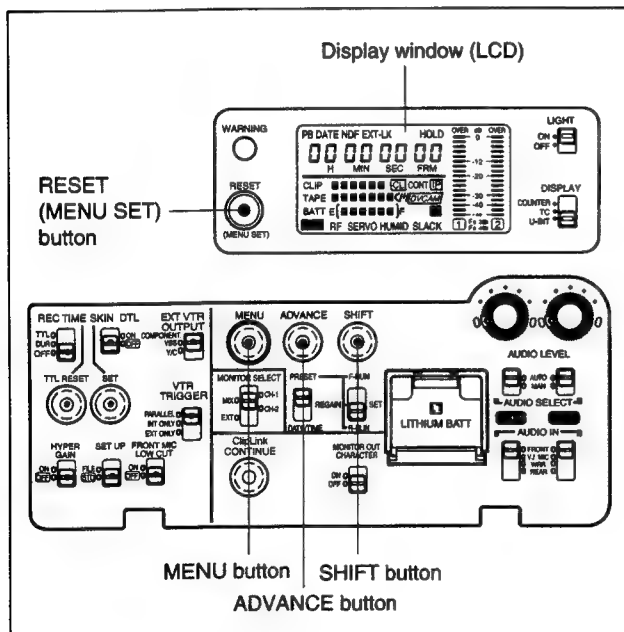
This mode is effective only when the power is ON.

When the power is turned OFF, it is automatically set to OFF.

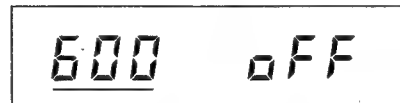
No. 605 switching position adjustment:

Performs automatic adjustment of the switching position.

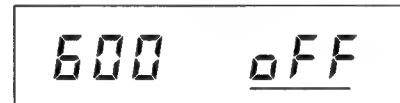
The method of setting menu No. 604 is as follows.
(Refer to Section 8-6 for how to set menu No. 605
"Switching position adjustment.")



1. Set the maintenance menu, and select Menu No. 601.
- (1) Press the MENU button while pressing the SHIFT button, then release the SHIFT button first, and release the MENU button after more than 1 second.
The display window (LCD) will display as follows.
(Characters underlined on the display window (LCD) in the description of operations hereafter indicate that they are blinking.)

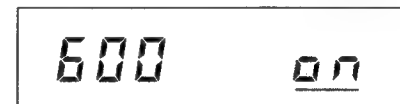


- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.
The display window (LCD) will display as follows.



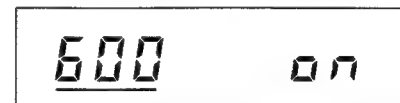
Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on."
The display window (LCD) will display as follows.



Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

- (4) Press the RESET (MENU SET) button once.
The display window (LCD) will display as follows.



Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button once to display Menu No. 604.

The display window (LCD) will display as follows.

A rectangular box representing the LCD display window. Inside, the number '604' is shown in a digital, seven-segment font.

Each time the ADVANCE button is pressed, Menu Nos. are changed as follows.

600 → 601 → 603 → ... → 513 → 600 → 601 → ...

Each time the SHIFT button is pressed, Menu Nos. are changed as follows.

600 → 513 → 509 → ... → 601 → 600 → 513 → ...

- (6) Press the RESET (MENU SET) button.

The display window (LCD) will display as follows.

A rectangular box representing the LCD display window. Inside, the number '604' is shown on the left and the text 'oFF' is shown on the right, both in a digital font.

- (7) Press the ADVANCE button to select "10."

(Each time the ADVANCE button is pressed, "oFF → 10 → 5 → 20 → oFF" is repeatedly displayed.)

A rectangular box representing the LCD display window. Inside, the number '604' is shown on the left and the number '10' is shown on the right, both in a digital font.

- (8) Press the RESET (MENU SET) button.

"604" is displayed and the mode is set.

8-3. TRACKING ADJUSTMENT

Equipment and Tool

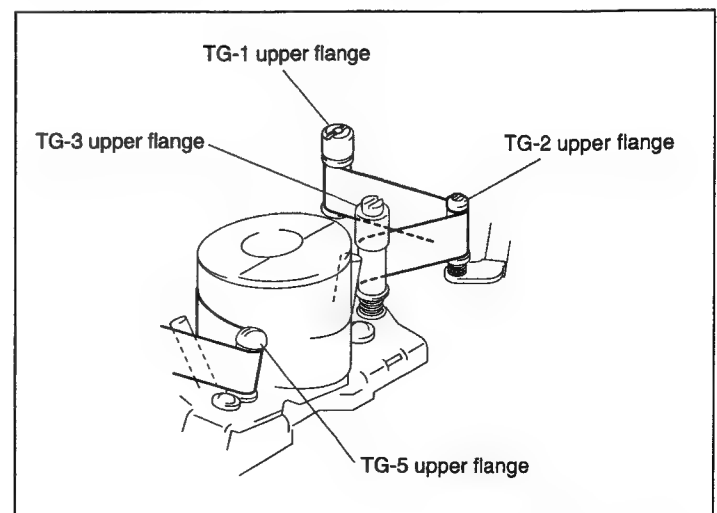
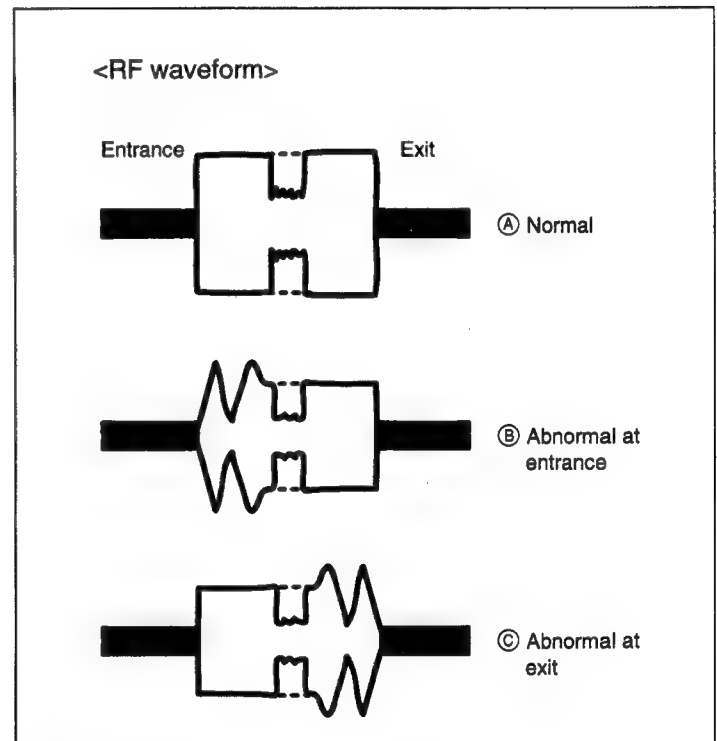
- Alignment tape, XH2-1AST
- RF extension tool
- Oscilloscope

Setting

1. Connect the RF extension tool to CN775 of RP-91 board.
2. Connect the oscilloscope as follows.
CH1: RF/RF extension tool (RF waveform)
CH2: JSW/RF extension tool (Switching waveform)
Trigger: CH2
3. Select maintenance menu No. 604-10, center ITI mode for tracking adjustment.
(Refer to Section 8-2.)
4. Insert an alignment tape into the unit.

8-3-1 Tracking Rough Adjustment

1. Set the PLAY mode.
2. Check that the tape runs along the TG-2 lower flange, TG-3 upper flange, TG-5 upper flange and TG-7 upper flange. (Refer to Section 8-1-6. Tape Path State.)
Then, check that there are no curls on the TG-1 and TG-8 upper flange.
(At this time, the tape need not along the TG-1 and TG-8 upper flange.)
3. Check that both the RF waveform at both the entrance and exit is flat on the oscilloscope.
4. If RF waveform does not flat, rotate the TG-3 and TG-5 upper flange, and adjust so that it makes flat.



8-3-2. TG-1, TG-2, TG-3 and TG-5 Guides Adjustment

Equipment and Tool

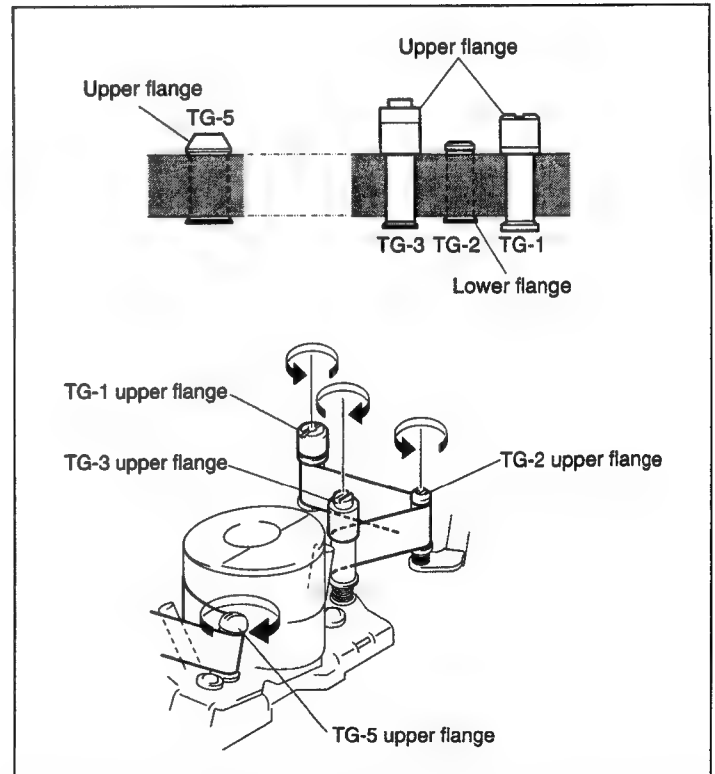
- Alignment tape, XH2-1AST
- RF extension tool
- Oscilloscope

Setting

1. Connect the RF extension tool to CN775 of RP-91 board.
2. Connect the oscilloscope as follows.
CH1: RF/RF extension tool (RF waveform)
CH2: JSW/RF extension tool (Switching - waveform)
Trigger: CH2
3. Select maintenance menu No. 604-10, center ITI mode for tracking adjustment. (Refer to Section 8-2.)
4. Insert an alignment tape into the unit.

Adjusting Method

1. Set the PLAY mode.
2. Check that there are no curls at the TG-1 upper flange.
If curled, rotate the upper flange in the counterclockwise direction, and adjust so that remove the curls.
3. Check that the tape runs along the TG-2 lower flange (no space between the two).
If it does not, rotate the upper flange in the counterclockwise direction, and adjust so that it does.
4. Check that the tape runs along the TG-3 upper flange (no space between the two).
If it does not, rotate the adjustment nut in the clockwise direction, and adjust so that it does.
5. Check that the tape runs along the TG-5 upper flange (no space between the two). If it does not, rotate the upper flange in the clockwise direction, and adjust so that it does.



8-3-3. TG-7 and TG-8 Guides Adjustment

Equipment and Tool

- Alignment tape, XH2-1AST
- RF extension tool
- Oscilloscope

Setting

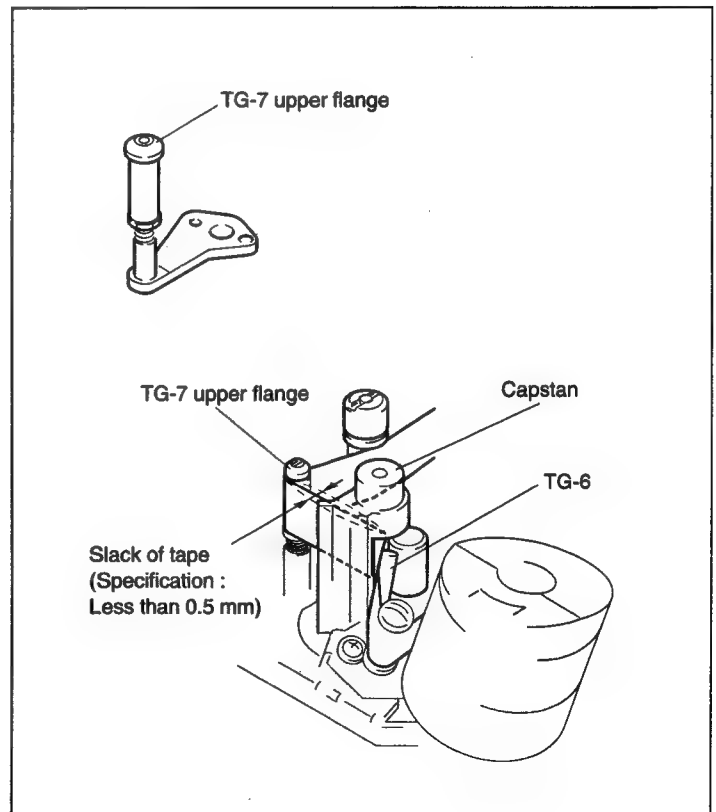
1. Connect the RF extension tool to CN775 of RP-91 board.
2. Connect the oscilloscope as follows.
CH1: RF/RF extension tool (RF waveform)
CH2: JSW/RF extension tool (Switching waveform)
Trigger: CH2
3. Select maintenance menu No. 604-10, center ITI mode for tracking adjustment. (Refer to Section 8-2.)
4. Insert an alignment tape into the unit.

Adjusting Method

1. Set the PLAY mode.

Check that the slack of the tape between the capstan and the TG-7 upper flange satisfies the specification.

If it does not, rotate the TG-7 upper flange, and adjust so that the tape does not slack.

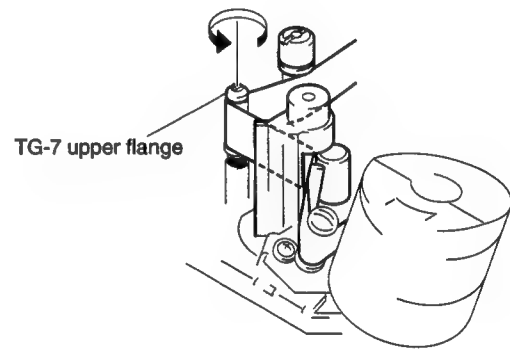
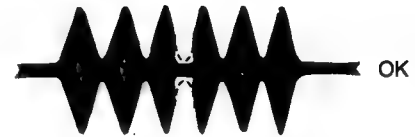


2. Set the REV search mode.

Check the RF waveform at the exit.

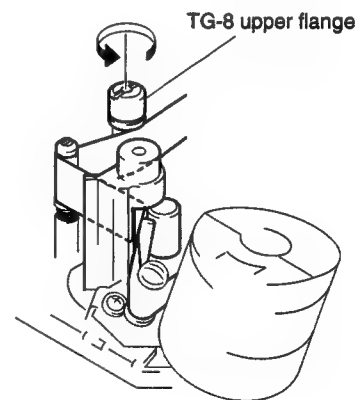
If RF waveform is no good, rotate the TG-7 upper flange in the counterclockwise direction by 90°, and perform steps 1 and 2 again.

<RF waveform>



3. Set the REV search mode. Check that no curls are formed on the TG-8 upper flange.

If curls are formed, rotate the TG-8 upper flange in the counterclockwise direction and remove the curls.



8-3-4. Tracking Adjustment

Equipment and Tool

- Alignment tape, XH2-1AST
- RF extension tool
- Oscilloscope

Setting

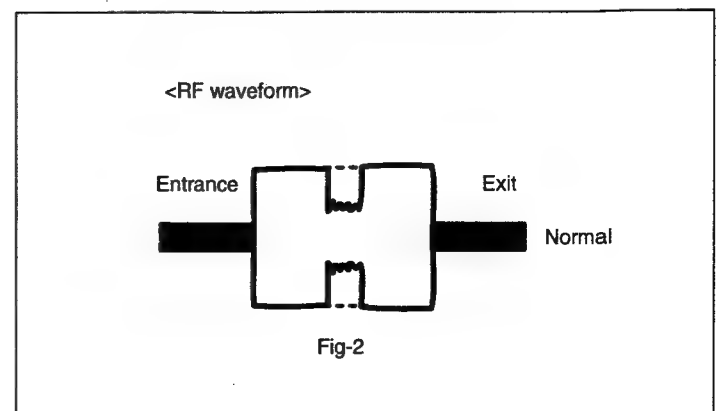
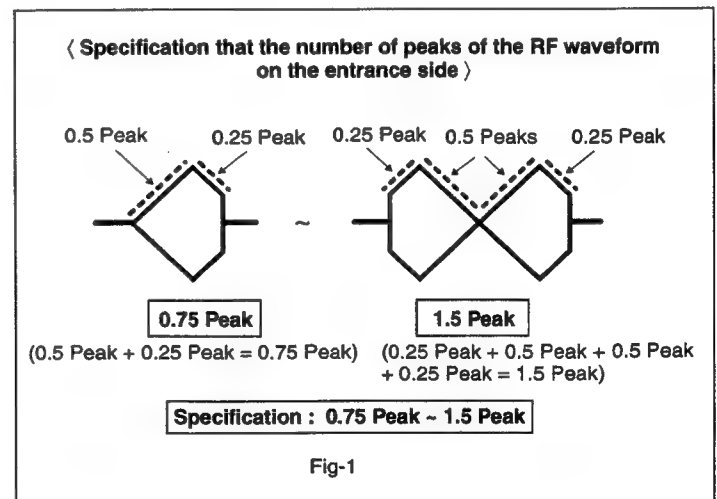
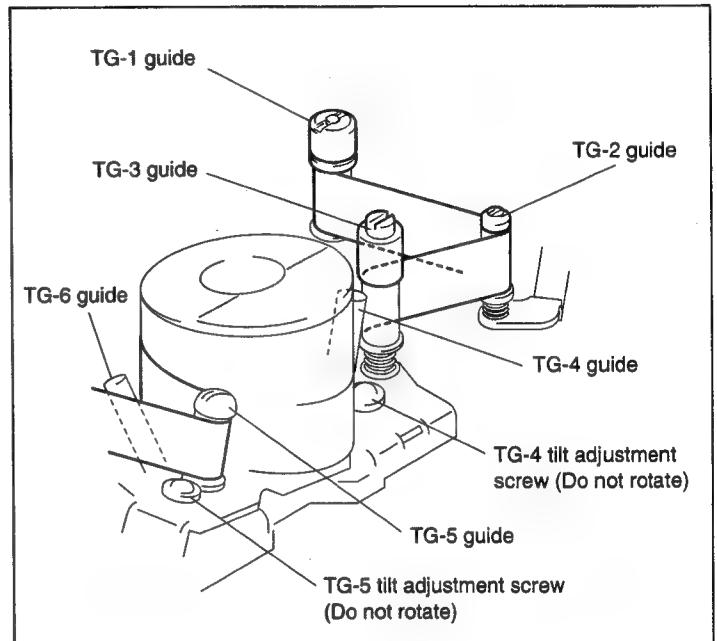
1. Connect the RF extension tool to CN775 of RP-91 board.
2. Connect the oscilloscope as follows.
CH1: RF/RF extension tool (RF waveform)
CH2: JSW/RF extension tool (Switching waveform)
Trigger: CH2
3. Select maintenance menu No. 604-10, center ITI mode for tracking adjustment. (Refer to Section 8-2.)
4. Insert an alignment tape into the unit.

Adjusting Method

1. Set the unit in PLAY mode.
2. Adjust the RF waveform on the entrance side to become flat by turning the flange of the TG-3 guide.
3. Turn the flange of the TG-3 guide 180° counterclockwise, and check to see that the number of peaks of the RF waveform on the entrance side meets the specification. (Refer to Fig. 1)
4. If the number of peaks does not meet the specification, perform the following adjustment;
*In case the number is 1.5 or more
Turn the flange of the TG-2 guide clockwise so that the number of peaks meets the specification.
*In case the number is 0.75 or less
Turn the flange of the TG-2 guide counterclockwise so that the number of peaks meets the specification.
5. Adjust the RF waveform on the entrance side to become flat by turning the flange of the TG-3 guide clockwise. (Refer to Fig. 2)

Note: Be sure to finish the adjustment by turning the flange of the TG-3 guide clockwise.

Note: If turning the flange of the TG-3 guide clockwise too much, return the flange back to the original position and re-start the adjustment. Finish it by turning the flange clockwise.



6. Adjust the RF waveform on the exit side to become flat by turning the flange of the TG-5 guide.
7. Be sure to finish the adjustment by turning the flange of the TG-5 guide clockwise.

Note: If turning the flange of the TG-5 guide clockwise too much, return the flange back to the original position and re-start the adjustment. Finish it by turning the flange clockwise.

Note: Do not turn the tilt adjustment screws of the TG-4 and TG-5 guides.

8. Set the REV search mode, and check that there are no curls formed at the lower flange of the TG-2 guide. If curled, perform steps (1), (2) and (3).
 - (1) Rotate the upper flange of the TG-2 guide in the clockwise direction to remove the curls.
 - (2) Rotate the upper flange of the TG-3 guide in the counterclockwise direction by 180°, and check that the tape rises. Then return the nut to its original position.
 - (3) If not certified the specification, Perform the step 4 and step 5.

8-4. CHECK AFTER TRACKING ADJUSTMENT

Equipment and Tool

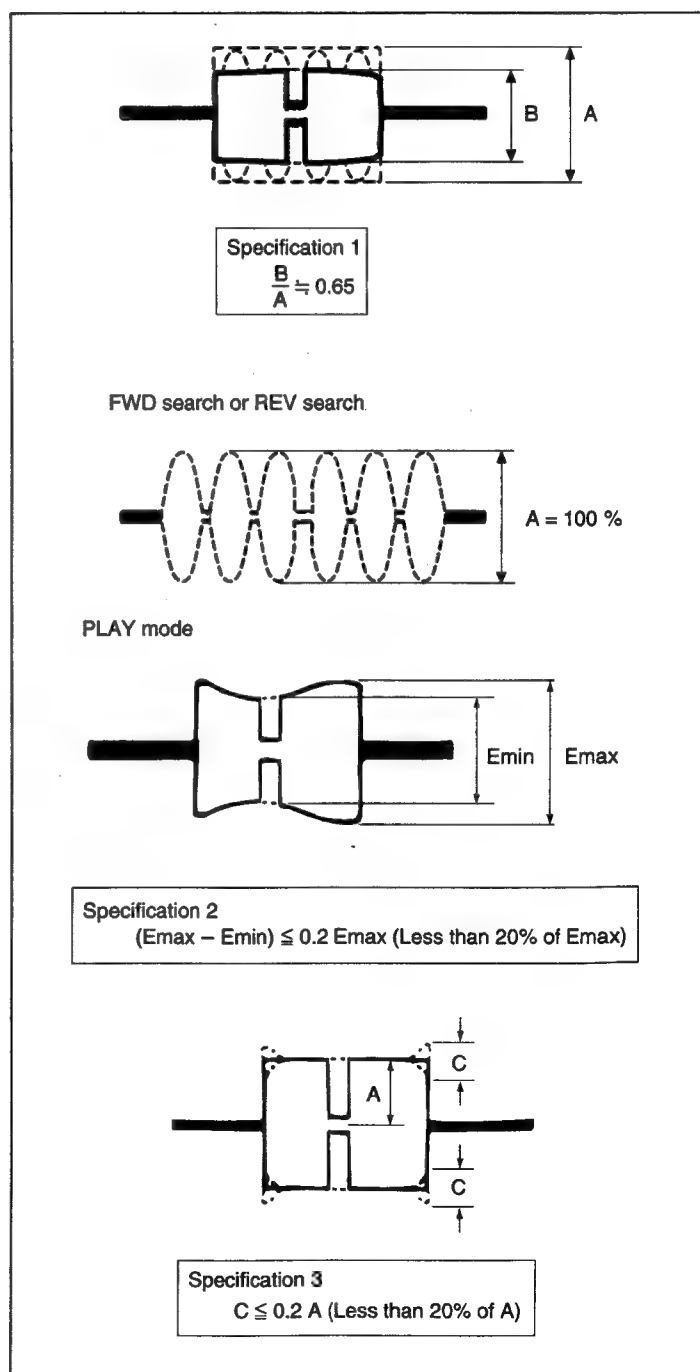
- Alignment tape, XH2-1AST
- RF extension tool
- Oscilloscope

Setting

1. Connect the RF extension tool to CN775 of RP-91 board.
2. Connect the oscilloscope as follows.
CH1: RF/RF extension tool (RF waveform)
CH2: JSW/RF extension tool (Switching waveform)
Trigger: CH2
3. Select maintenance menu No. 604-10, center ITI mode for tracking adjustment. (Refer to Section 8-2.)
4. Insert an alignment tape into the unit.
5. Perform checks after Section 8-4-1.

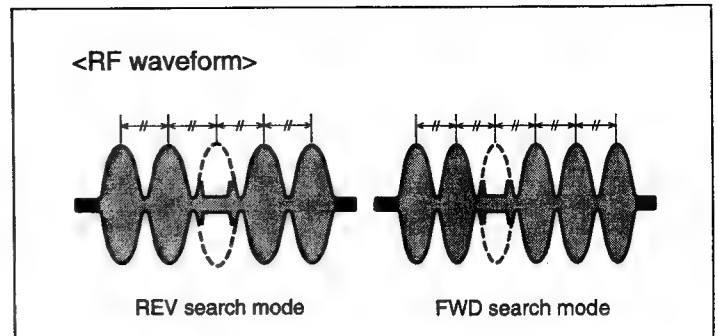
8-4-1. Tracking Check

1. Set the FWD search/REV search mode, assuming that the output level of the RF waveform is A (= 100 %).
2. Set the PLAY mode, assuming that the RF waveform output level is B (= 65 %).
3. Check that the A and B levels are Specification 1.
4. Check to see that the difference in the amplitude between Emax and Emin in the PLAY mode is less than 20 % Emax. (Specification 2)
5. Check to see that no significant fluctuations are observed in the waveform. (Specification 3)



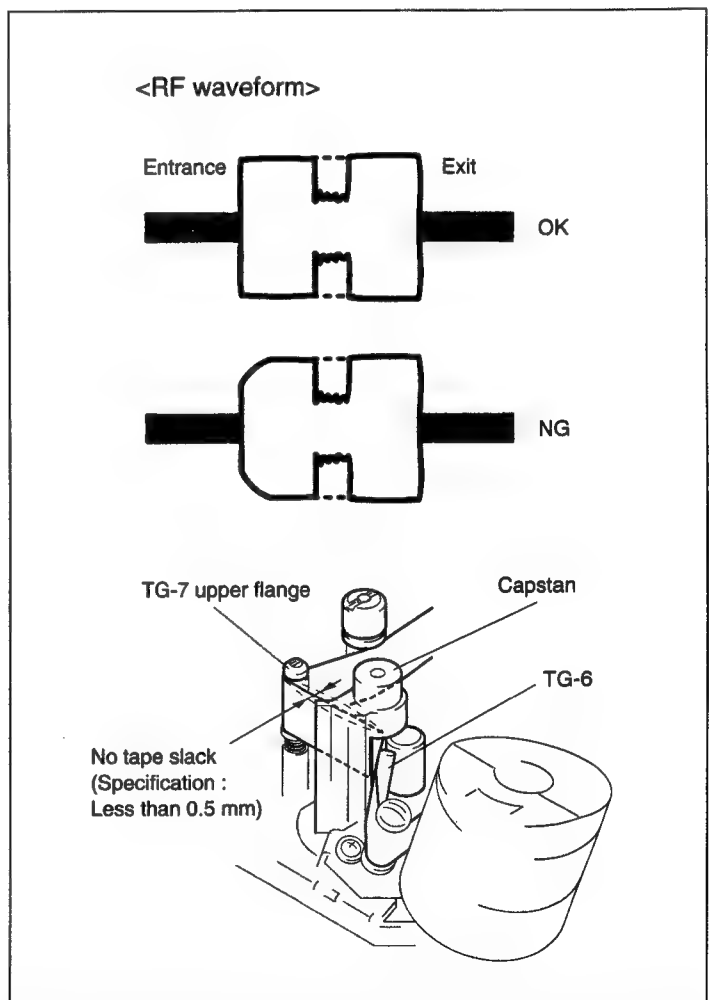
8-4-2. FWD Search and REV Search Check

1. Set the REV search mode.
Check that the pitches of the peaks of the RF waveform are equal.
If not equal, perform 8-4. Tracking Adjustment again.
2. Set the FWD search mode.
Check that the pitches of the peaks of the RF waveform are equal.
If not equal, perform 8-4. Tracking Adjustment.



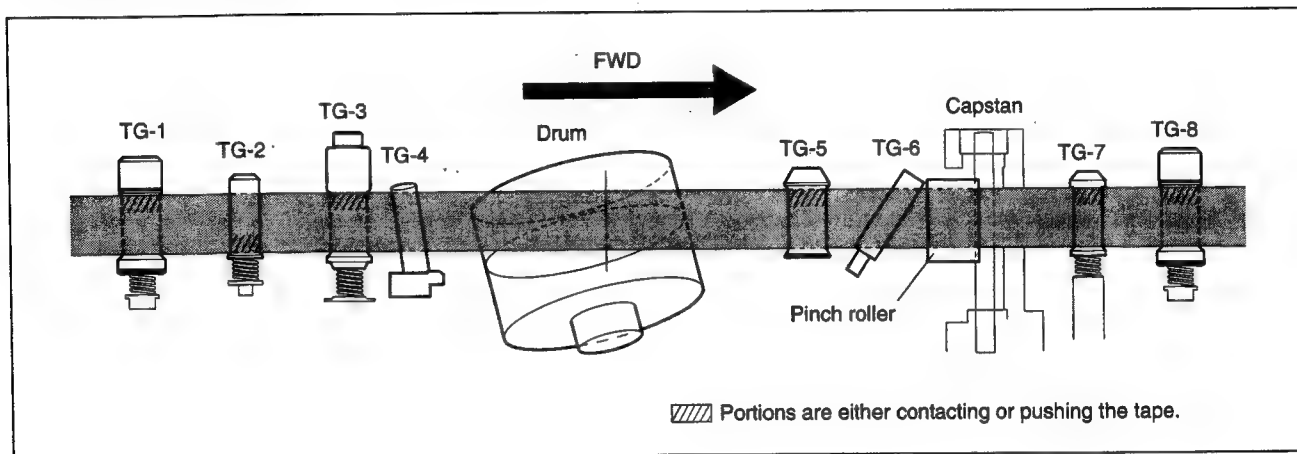
8-4-3. Rising Check

1. When the mode changed to PLAY mode from STOP mode, check that the RF waveform rises horizontally within three seconds (from when the RF waveform appears on the oscilloscope).
Check that the tape does not slack near the capstan at this time.
2. When the PLAY mode is set after the FWD search/REV search mode, and FF/REW mode, check that the RF waveform rises horizontally within three seconds. Check that the tape does not slack near the capstan at this time.



8-4-4. Tape Path Check

1. Set the FWD search/REV search mode, and check that there are no large curls on the TG-1 upper flange, TG-2 lower flange, TG-3 upper flange, TG-5 upper flange, TG-7 upper flange, and TG-8 upper flange.



8-5. CHECK OF SELF-RECORDING TAPE PLAYBACK

Equipment and Tools

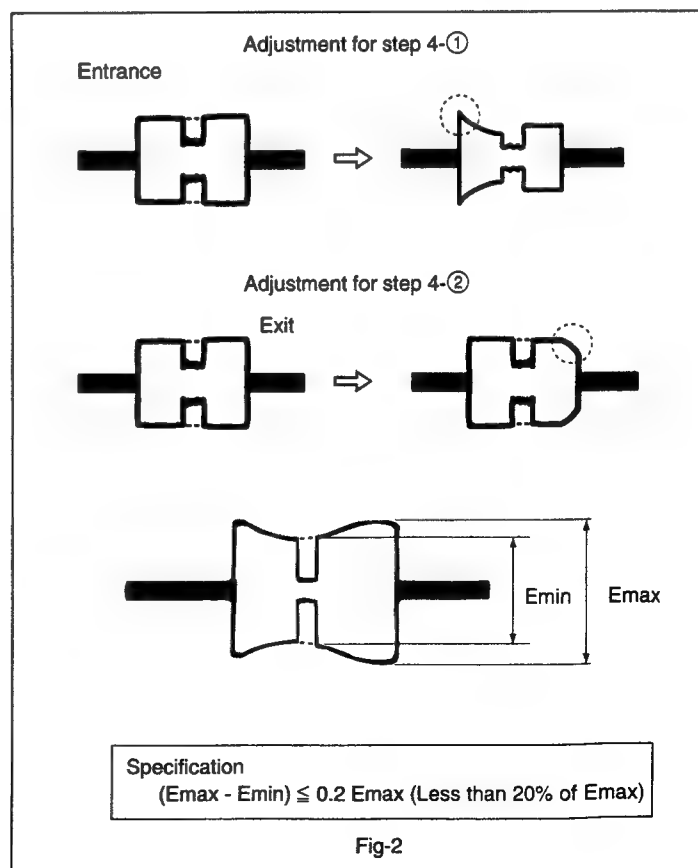
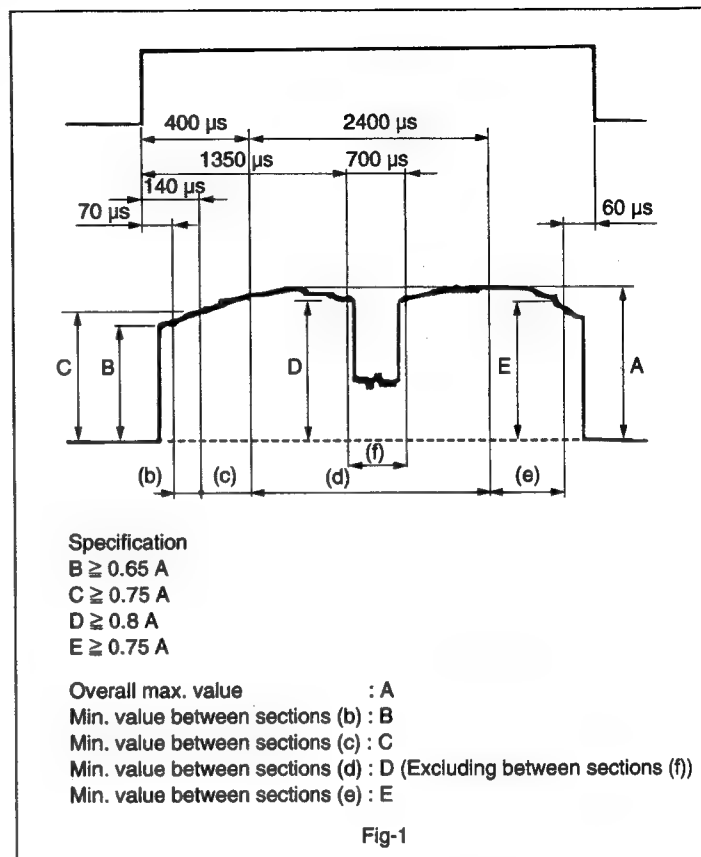
- RF extension tool
- Blanking tape
- Oscilloscope
- Alignment tape, XH2-1AST

Setting

1. Connect the RF extension tool to CN775 of RP-91 board.
2. Connect the oscilloscope as follows.
CH1: RF/RF extension tool (RF waveform)
CH2: JSW/RF extension tool (Switching waveform)
Trigger: CH2
3. Insert the blanking tape into the unit.
4. Select maintenance menu No. 604-10, center ITI mode for tracking adjustment. (Refer to Section 8-2.)
5. Set the REC mode, and record the center ITI 10 MHz single signal to the tape from the top for three to ten minutes.

Checking Method

1. Set the unit in PLAY mode and playback the portion recorded in the setting step 5.
 2. Check to see that the tape runs correctly along the TG-2 lower flange, the TG-3 upper flange, the TG-5 upper flange, and the TG-7 upper flange, and that no curls are found on the TG-1 upper flange, and the TG-8 upper flange. (Refer to Sections 8-1-5 and 8-1-6.)
 3. Verify that the RF waveform on the oscilloscope meets the specification. (Refer to Fig. 1)
 4. If the RF waveform does not meet the specification, re-perform the adjustments, Section 8-3 Tracking Adjustment, and the following ① and ②.
 - ① In case that the RF waveform on the entrance side does not meet the specification during self-recording tape playback (Refer to Fig. 1)
- Adjust the RF waveform on the entrance side to become flat by performing the tracking adjustment, and raise the RF waveform on the entrance side within the specification by turning the flange of the TG-3 guide counterclockwise. (Refer to Fig. 2)



- ② In case that the RF waveform on the exit side does not meet the specification during self-recording tape playback (Refer to Fig. 1)
- Adjust the RF waveform on the exit side to become flat by performing the tracking adjustment, and lower the RF waveform on the exit side within the specification by turning the flange of the TG-5 guide clockwise.
(Refer to Fig. 2)
5. Set the REC mode, and record the center ITI 10 MHz single signal to the tape from the top for three to ten minutes.
 6. Set the PLAY mode, and playback the portion recorded in the setting step 5.
 7. Check to see that the tape runs correctly along the TG-2 lower flange, the TG-3 upper flange, the TG-5 upper flange, and the TG-7 upper flange, and that no curls are found on the TG-1 upper flange, and the TG-8 upper flange. (Refer to Sections 8-1-5 and 8-1-6.)
 8. Check that the RF waveform meets the specification on the oscilloscope.
(Refer to Fig-1)

8-6. SWITCHING POSITION ADJUSTMENTS

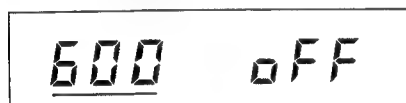
Tools

Alignment tape XH5-1A (for DSR-500WS)

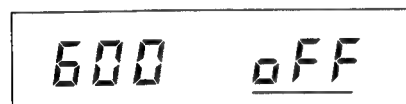
Alignment tape XH5-1AP (for DSR-500WSP)

Checking Method

1. Check that there is no tape in the unit.
2. Set the maintenance menu, and select Menu No. 607.
- (1) Press the MENU button while pressing the SHIFT button, then release the SHIFT button first, and release the MENU button after more than 1 second.
The display window (LCD) will display as follows.
(Characters underlined on the display window (LCD) in the description of operations hereafter indicate that they are blinking.)



- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.
The display window (LCD) will display as follows.



Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on."
The display window (LCD) will display as follows.



Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

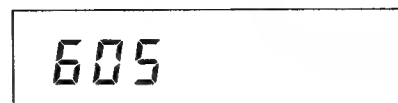
- (4) Press the RESET (MENU SET) button once.
The display window (LCD) will display as follows.



Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button or SHIFT button to display Menu No. 605.

The display window (LCD) will display as follows.



Each time the ADVANCE button is pressed, Menu Nos. are changed as follows.

600 → 601 → 603 → ... → 513 → 600 → 601 → ...

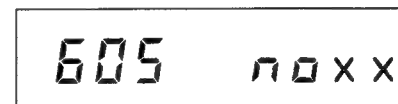
Each time the SHIFT button is pressed, Menu Nos. are changed as follows.

600 → 513 → 509 → ... → 601 → 600 → 513 → ...

3. Press the RESET (MENU SET) button.
4. Insert the alignment tape XH5-1A/XH5-1AP into the unit. An adjustment is automatically performed, and after the completion of the adjustment, the tape is automatically ejected.
5. Check that the display window (LCD) displays as follows.



If the display window (LCD) displays as follows, exit menu No. 605 once, and perform after step 3 again.
If the problem is still not solved, check if the unit is failure.



XX: 30 → Servo lock can not be executed in the playback.
31 → Cannot read adjustment data.
E0 → Cannot save data.
Fd → Menu not supported.
FE → Adjustment prohibited (E.g.: Tape loaded).

<Items to be checked>

- Has the tape path adjustment been performed correctly?
- Is a head clogged?

6. Press the MENU button to exit the maintenance menu.
The display window (LCD) will return to the state before the maintenance menu was displayed.

SECTION 9

GENERAL INFORMATION FOR ELECTRICAL ALIGNMENT

9-1. ADJUSTING ITEMS

AA-104 Board

RV201 TONE Level Adjustment 10-3-16

AT-127 Board

CV501 4:3 Title Adjustment 10-3-15

CV502 Character Position Adjustment 10-3-14

ES-26 Board

FL101 Chroma Phase Adjustment 10-3-6

RV101 Chroma (VBS) Level Adjustment 10-3-6

RV103 B-Y Level Adjustment 10-3-6

RV104 Y (VBS) Level Adjustment 10-3-7

FP-118 Board

CV200 Clock Frequency Adjustment 11-1-1

RV401 CH-1 Audio Level Volume
Reference Position Adjustment 11-4-1

RV402 CH-2 Audio Level Volume
Reference Position Adjustment 11-4-1

RV403 Limiter Level Adjustment 11-4-3

RV601 CH-1 Monitor Output Level
(LINE OUT Level) Adjustment 11-4-2

RV602 CH-2 Monitor Output Level
(LINE OUT Level) Adjustment 11-4-2

PA-219 (B) Board

RV1 CCD OUT Level Adjustment 10-3-9

PA-221 (R) Board

RV1 CCD OUT Level Adjustment 10-3-9

Service Menu

PAGE 2

R W.SHAD 10-3-12

G W.SHAD 10-3-12

B W.SHAD 10-3-12

PAGE 3

R FLARE 10-3-13

G FLARE 10-3-13

B FLARE 10-3-13

PAGE 5

W Y LEV 10-3-4

W R-Y LEV 10-3-4

W B-Y LEV 10-3-4

Y LEV 10-3-4

R-Y LEV 10-3-4

B-Y LEV 10-3-4

SYNC LEV 10-3-4

PAGE 6

Y CLP 10-3-3

R-Y CLP 10-3-3

B-Y CLP 10-3-3

PAGE 7

R-Y C/B 10-3-5

R-Y BST 10-3-6

B-Y C/B 10-3-5

B-Y BST 10-3-6

VF SYNC 10-3-8

VF BLKG 10-3-8

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SC FREQ 10-3-1

SC-H 10-3-2

PAGE 9

VTR R-Y 11-5-5

VTR B-Y 11-5-6

VTR Y 11-5-2

B-Y DELAY ... 11-5-3

R-Y DELAY ... 11-5-4

PAGE 10

VTR SYNC 11-5-1

VTR BST 11-5-7

PB VBS 11-5-8

EE S-Y 11-5-9

EE S-C 11-5-10

PAGE 11

SETUP 10-3-7

PAGE 12

TEST 10-3-3, 4

R-Y 10-3-3, 4

B-Y 10-3-3, 4

PAGE 17

M.BLACK 10-3-10

PAGE 27

R D.DARK 10-3-11

G D.DARK 10-3-11

B D.DARK 10-3-11

9-2. EQUIPMENT AND TOOLS REQUIRED

Equipment

Oscilloscope: Tektronix 2445B (200 MHz) or equivalent
Frequency counter: Iwasaki SC-7102 or equivalent
Vectorscope:
Waveform monitor: Tektronix 1765 or equivalent
Monochrome monitor:
Color monitor:
Audio signal generator: Hewlet Packard HP8904 or equivalent
Audio level meter: Hewlet Packard HP3400A or equivalent

Tools

Pattern box: PTB-500, Sony part number J-6029-140-B
Grayscale chart: Sony part number J-6026-130-B
DC power supply: Sony CMA-8/8A or AC-500/550
Extension board: EX-622, Sony part number J-6276-320-A
Tripod adaptor: Sony VCT-U14
Blank tape: Sony DVM30ME, DVM30NME or equivalent
Alignment tape: For DSR-500WS: XH5-1A, Sony part number: 8-967-999-21
For DSR-500WSP: XH5-1AP, Sony part number: 8-967-999-25
S-BNC video cable: Sony part number J-6381-380-A

Contents of Alignment Tape for DSR-500WS: XH5-1A

VIDEO	TIME CODE (h) (m) (s)	REC (sec.)	AUDIO	
Black burst	23 : 59 : 00	60	No signal	
75 % full color bars	00 : 00	60	1 kHz	
60 % multi burst	01 : 00	60	20 Hz	
Bowtie with mod 12.5T	02 : 00	30	14.5 kHz	
Shallow ramp	02 : 30	30	10 kHz	
	03 : 00	30	No signal	
Cross hatch (index)	03 : 30	30	1 kHz 0 dBFS	
Line 17	04 : 00	40	1 ch	1 kHz
75 % full color bars	04 : 40	40	2 ch	
Quad phase	05 : 20	40	3 ch	
	06 : 00	40	4 ch	
Black burst	06 : 40	5	No signal	
	06 : 45	5		
60 % multi burst (for composite)	06 : 50	60	1 kHz	
Mod 12.5T	07 : 50	30	20 Hz	
Shallow ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz	
	08 : 50	30	10 kHz	
Cross hatch (index)	09 : 20	30	1 kHz 0 dBFS	
Chroma noise	09 : 50	30	1 kHz	
Line 17	10 : 20	30		
75 % full color bars	10 : 50	180		
60 % multi burst	13 : 50	60		
Mod 12.5T	14 : 50	30		
Shallow ramp	15 : 20	60		
75 % full color bars	16 : 20	100		
75 % full color bars (R-Y OFF)	18 : 00	180		
75 % full color bars (B-Y OFF)	21 : 00	180		
Blanking marker	24 : 00	180		
Line 17 (R-Y OFF)	27 : 00	180		
Line 17 (B-Y OFF)	30 : 00	180		

* Audio levels are -20 dBFS (Reference), except 1 kHz 0 dBFS part.

Contents of Alignment Tape for DSR-500WSP: XH5-1AP

VIDEO	TIME CODE (h) (m) (s)	REC (sec.)	AUDIO	
Black burst	23 : 59 : 00	60	No signal	
100 % full color bars	00 : 00	60	1 kHz	
60 % multi burst	01 : 00	60	20 Hz	
Bowtie with mod 10T	02 : 00	30	14.5 kHz	
Shallow ramp	02 : 30	30	10 kHz	
	03 : 00	30	No signal	
Cross hatch (index)	03 : 30	30	1 kHz 0 dBFS	
Line 17	04 : 00	40	1 ch	1 kHz
100 % full color bars	04 : 40	40	2 ch	
Quad phase	05 : 20	40	3 ch	
	06 : 00	40	4 ch	
Black burst	06 : 40	5	No signal	
	06 : 45	5		
60 % multi burst (for composite)	06 : 50	60	1 kHz	
Mod 10T	07 : 50	30	20 Hz	
Shallow ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz	
	08 : 50	30	10 kHz	
Cross hatch (index)	09 : 20	30	1 kHz 0 dBFS	
Chroma noise	09 : 50	30	1 kHz	
Line 17	10 : 20	30		
100 % full color bars	10 : 50	180		
60 % multi burst	13 : 50	60		
Mod 10T	14 : 50	30		
Shallow ramp	15 : 20	60		
100 % full color bars	16 : 20	100		
100 % full color bars (R-Y OFF)	18 : 00	180		
100 % full color bars (B-Y OFF)	21 : 00	180		
Blanking marker	24 : 00	180		
Line 17 (R-Y OFF)	27 : 00	180		
Line 17 (B-Y OFF)	30 : 00	180		

* Audio levels are -18 dBFS (Reference), except 1 kHz 0 dBFS part.

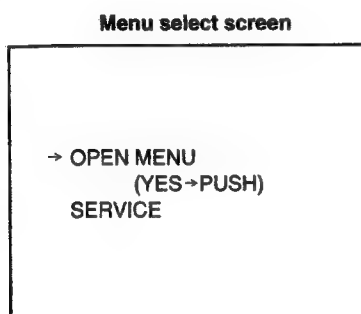
9-3. MENU OPERATION

Service Mode

There are the three major menus, BASIC menu and ADVANCE menu for user, and SERVICE menu.

The unit enters the service mode by setting the switch S811 (OPE/ADJ) on the FP-118 board to ADJ position.

In service mode, the following menu select screen is displayed:



Operation of Menu Select Screen

1. To move the cursor
Each time the menu switch is pushed toward "OFF," the cursor moves in between the OPEN MENU and menu name.
The status screen is displayed by pulling the menu switch toward "ON."
The cursor can be moved by turning the menu dial during blinking the cursor.
2. To select the menu
Turn the menu dial during blinking the menu name. As turning of the MENU dial, the following menu names will be appeared cyclically.
SERVICE ⇔ BASIC ⇔ ADVANCE ⇔ FILE
⇔SERVICE
When the cursor is moved to the menu name with menu dial, the cursor blinks. In this case, change the menu name after changing the blinking section from cursor to menu name by turning the menu dial.
When the menu dial is pressed during blinking the menu name, the cursor blinks.
3. To open the selected menu
Display the menu name to be opened. Move the cursor to OPEN MENU and push the menu dial. The first page of the selected menu is displayed.
After the menu selection, usual menu operation can be carried out.
When the selected menu had been finished, menu select screen is displayed.

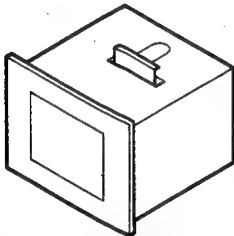
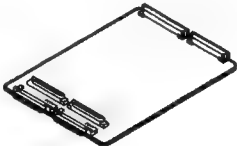
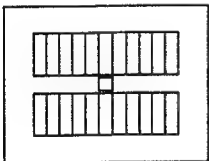
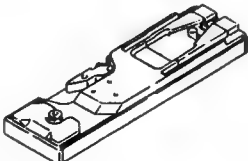
SECTION 10

CAMERA BLOCK ELECTRICAL ALIGNMENT

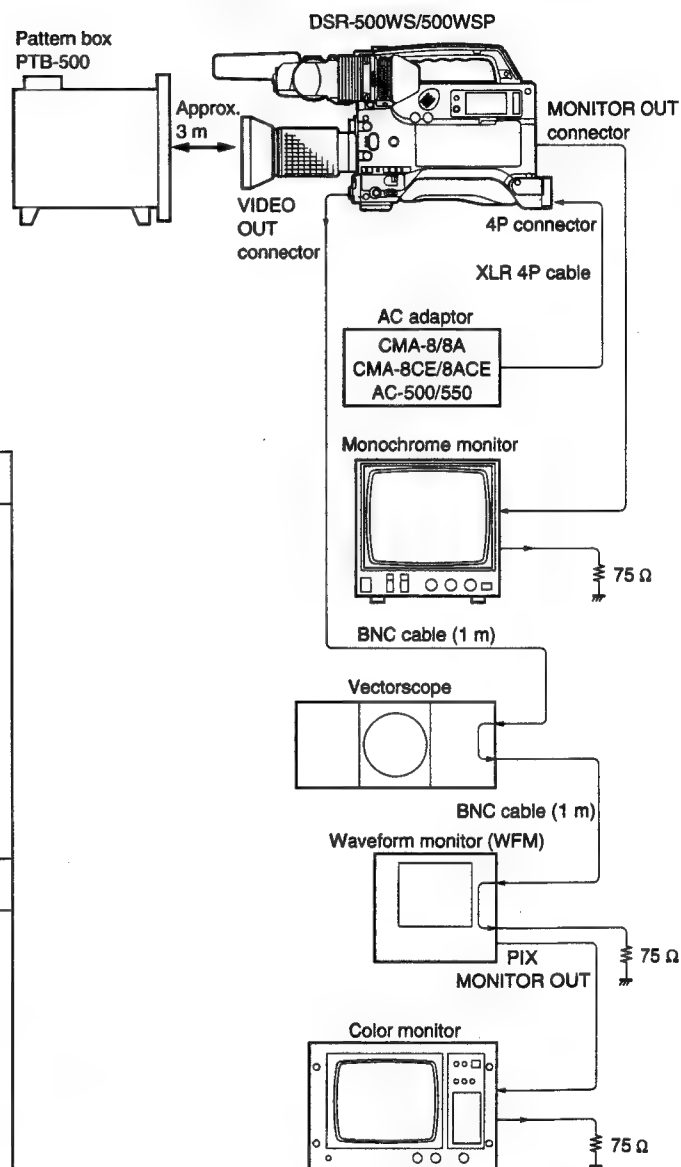
10-1. PREPARATION

10-1-1. Equipment Required

- Oscilloscope (200 MHz or more)
- Vectorscope
- Waveform monitor (Tektronix 1765 or equivalent)
- Monochrome monitor
- Color monitor
- AC adaptor (Sony CMA-8/8A/8CE/8ACE, AC-500/550)
- Frequency counter

Pattern box PTB-500	Extension board EX-622
Sony part number: J-6029-140-B • Light source for test chart 	Sony part number: J-6276-320-A 
Grayscale chart	Tripod Adaptor VCT-U14
Sony part number: J-6026-130-B 	

10-1-2. Connection



Note: When adjusting the camera block, be sure to measure at VIDEO OUT except for 10-3-14. and 10-3-15.

10-1-3. Switch Setting before Adjustment

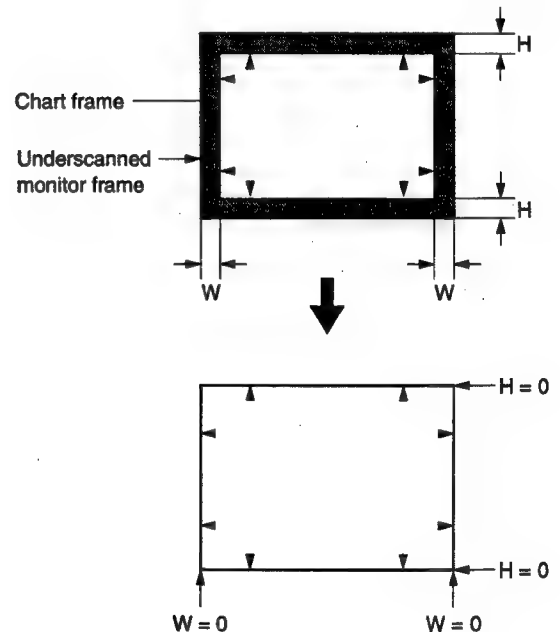
Switch setting for camera side

GAIN switch:	LOW (0 dB)
OUTPUT/DL/DCC+ switch:	CAM/DCC+
WHITE BAL switch:	PRESET
FILTER control:	1
SHUTTER switch:	OFF
HYPER GAIN switch:	OFF
SETUP switch:	STD
EZ MODE button:	OFF
A.IRIS MODE:	STD
ATW button:	OFF
ZEBRA button:	OFF

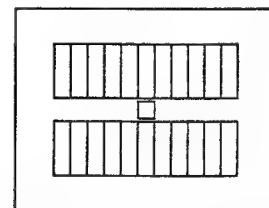
IRIS (Lens):	Manual
ZOOM (Lens):	Manual

10-1-4. Notes on Adjustment

- (1) Before adjustment, be sure to allow for 10-minute warm-up time.
- (2) When using the SERVICE menu, refer to "5-2-1. SERVICE MODE OPERATION."
- (3) Unless otherwise specified, the sentence "chart frame = underscanned monitor frame" is written about the shooting condition.
In this case, make sure that the lens is best focused. Then adjust the zoom control of the lens so that the chart frame touches the underscanned monitor frame.



In case of the Grayscale chart:



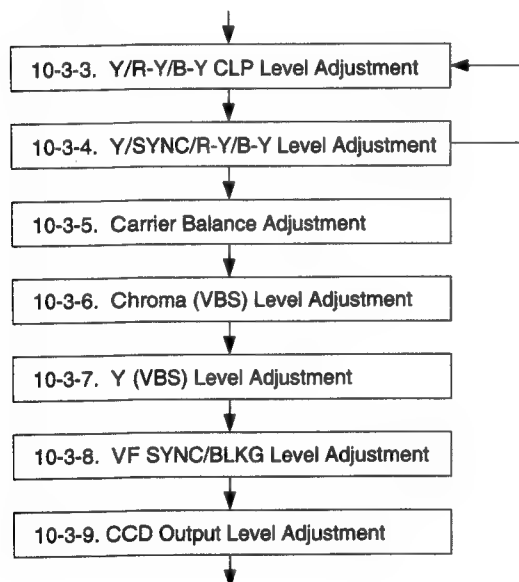
(underscanned monitor screen)

(4) When replacing the CCD unit, be sure to perform the following adjustment items.

- 10-3-10. Black Level Adjustment
- 10-3-11. Carrier Adjustment when DPR (Dual Pixel Readout) is On
- 10-3-12. Shading Adjustment
- 10-3-13. Flare Adjustment

(5) If the amplitude level of the measured waveform is blurred on the waveform monitor screen, set the RESPONSE switch on the waveform monitor to "LUM" mode.

(6) Be sure to perform the following adjustments successively.



10-1-5. Adjustment Item

10-2. Preparation before Adjustment

- 10-2-1. Color-Bar Signal Confirmation
- 10-2-2. Sensitivity Confirmation

10-3. Adjustment

- 10-3-1. Subcarrier Frequency Adjustment
- 10-3-2. INT SC-H Phase Adjustment
- 10-3-3. Y/R-Y/B-Y CLP Level Adjustment
- 10-3-4. Y/SYNC/R-Y/B-Y Level Adjustment
- 10-3-5. Carrier Balance Adjustment
- 10-3-6. Chroma (VBS) Level Adjustment
- 10-3-7. Y (VBS) Level Adjustment
- 10-3-8. VF SYNC/BLKG Level Adjustment
- 10-3-9. CCD Output Level Adjustment
- 10-3-10. Black Level Adjustment
- 10-3-11. Carrier Adjustment when DPR (Dual Pixel Readout) is On
- 10-3-12. Shading Adjustment
- 10-3-13. Flare Adjustment
- 10-3-14. Character Position Adjustment
- 10-3-15. 4:3 Title Adjustment
- 10-3-16. TONE Level Adjustment

10-1-6. Maintaining the Grayscale Chart

For the VA gain adjustment, using an 89.9 %-reflective grayscale chart is preferable.

If a reflective chart is not available, use a well-maintained pattern box and a transparent grayscale chart for adjustment. Before beginning adjustment, set the illumination of the light source (or the luminous intensity on the chart surface) properly proceeding as follows and set the color temperature to 3200 K exactly by adjusting light.

Information on the reflective grayscale chart

Recommended chart

The reflective grayscale chart is commercially available.

Recommended chart: Reflective grayscale chart (with a special case)

MURAKAMI COLOR RESEARCH LABORATORY GS-3 or equivalent

Supplier: MURAKAMI COLOR RESEARCH LABORATORY

Address: 3-11-3, Kachidoki, Chuo-ku, Tokyo, JAPAN

Postcode 104-0054

Phone: 81-3-3532-3011

Fax: 81-3-3532-2056

Handling precautions

- Do not touch the chart's surface.
- Do not subject the surface to dirt, scratches or prolonged exposure to sunlight.
- Protect the chart from excess moisture and harmful gas.
- Avoid resting articles against the case.
- Open the case and dry the chart more an hour for a month in no use long period.

Replacement period when the chart is used as the reference

The reflective grayscale chart should be replaced every two years if it used as the reference. Because the chart deteriorates with time and proper adjustment cannot be achieved.

Replacement period varies according to storage conditions of the chart.

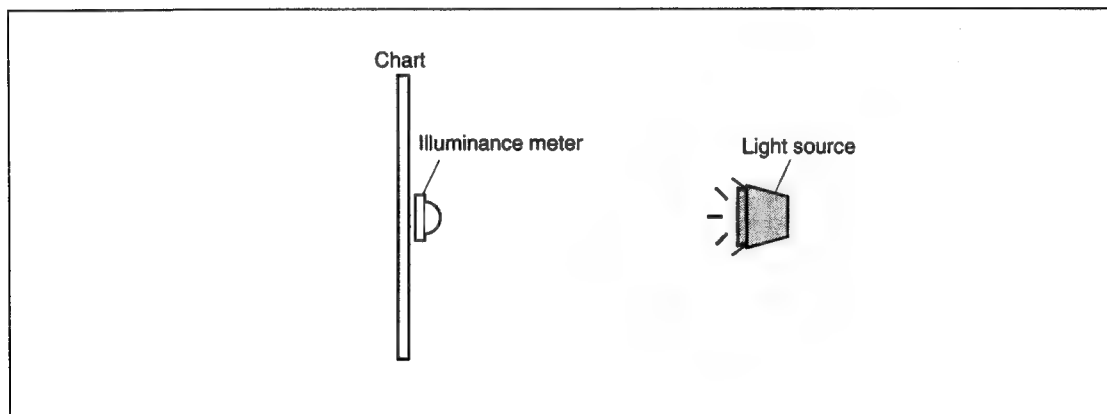
Setting illumination (when the reflective chart is used)

Equipment: Illuminance meter (Calibrated)

1. Turn on the light source and warm up for about 30 minutes.
2. Place the illuminance meter on the chart surface.
Adjust the position and angle of the light source so that the whole surface of the chart is evenly 2000 lx.

Note

Light the chart from almost the same direction and height as the camera to shoot the chart.



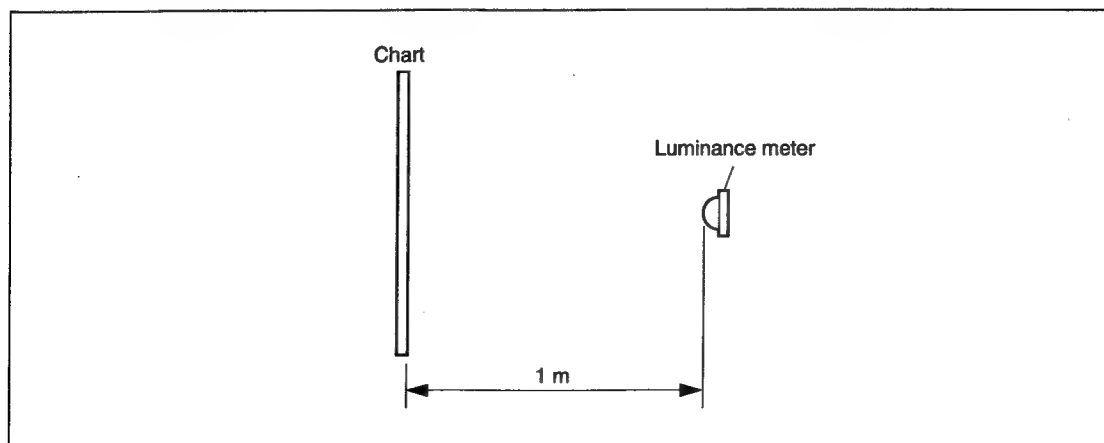
Setting luminous intensity (when the transparent chart is used)

Equipment: Luminance meter (Minolta LS-110 or equivalent. Calibrated.)

1. Light the pattern box and warm up for about 30 minutes.
2. Place the pattern box where the chart is not exposed to light, such as a darkroom.
(Or cover the pattern box with a cover whose inside is painted in black.)
3. Place the luminance meter facing straight to the chart at a distance of 1 m from it.
4. Adjust the luminance control of the pattern box so that the white portion in the center of the chart is $573 \pm 6 \text{ cd/m}^2$.

Note

This corresponds to the luminous intensity on the 89.9 %-reflective chart at 2000 lx.



10-2. BEFORE ADJUSTMENT

- Note:**
1. Before adjustment, connect the equipment referring to "10-1-2. Connection".
 2. Before adjustment, Turn on POWER switch and allow for 10-minute warm-up time.

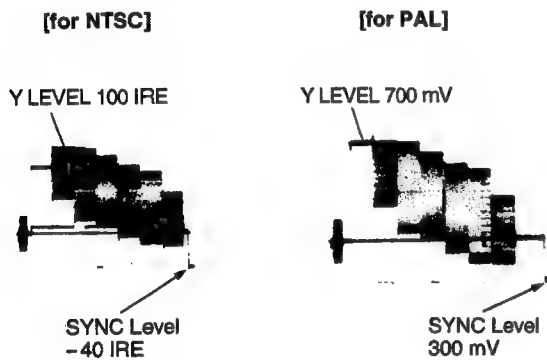
10-2-1. Color-Bar Signal Confirmation

Equipment: Vectorscope, Waveform monitor

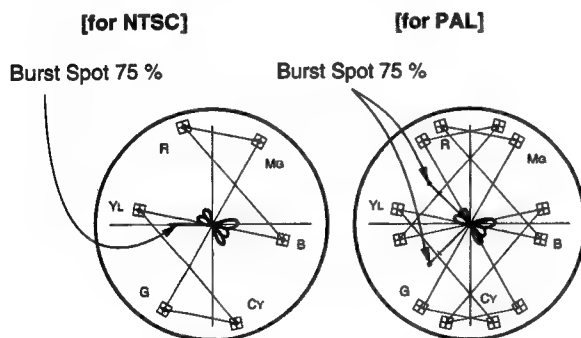
Preparation: OUTPUT/DL/DCC+ switch/camera side → BARS

Test point: VIDEO OUT connector/camera side

Specification:



- Chroma Level
Confirm that the beam spots of each color (R, YL, G, CY, G, B and MG) are inside the "EB" mark.



- Note:**
- Partial difference between scale and signal level is caused by photographic error.
 - If the specifications are not met, carry out from "10-3-2. INT SC-H Phase Adjustment" through "10-3-6. Chroma (VBS) Level Adjustment".

10-2-2. Sensitivity Measurement Confirmation

Object: Overall white

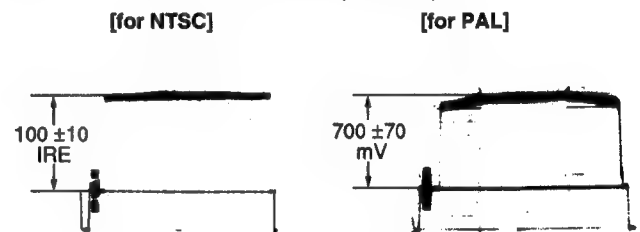
Light: 3200 K, 2000 lux
(If the pattern box is used, set the AUTO mode)

Preparation:

- Adjust the zoom control at "TELE" so that the white pattern frame touches the underscanned picture frame on the screen.
- Lens iris → F11
- OUTPUT/DL/DCC+ switch/camera side → CAM
- WHITE BAL switch/camera side → PRESET

Equipment: Waveform monitor

Specification: 100 ± 10 IRE (for NTSC)
 700 ± 70 mV (for PAL)



Note: If the specification is not met, perform "10-3-9. CCD OUT Level Adjustment."

10-3. CAMERA ADJUSTMENT

Note: Before the adjustment, enter the "PAGE 1" of SERVICE menu, and perform the "RESET".

10-3-1. Sub-Carrier Frequency Adjustment

Equipment: Frequency counter
To be extended: ES-26/26P board
Test point: TP801 (GND: E801)/ES-26/26P board
Adjusting point: SERVICE menu "PAGE 8"

→ SC FREQ :

Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.

Specification: 3,579,545 \pm 10 Hz (for NTSC)
 4,433,618 \pm 10 Hz (for PAL)

10-3-2. INT SC-H Phase Adjustment

Note: Stated below is a procedure with the SC-H phase measuring equipment (Tektronix Waveform monitor 1765).
 If any other equipment is used, perform adjustment at the following adjustment point by reading the instruction manual attached.

Equipment: Waveform monitor (SC-H Phase mode)
Preparation:

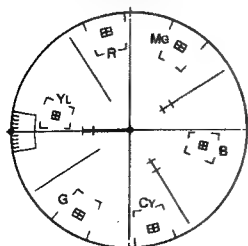
- Put the Tektronix Waveform monitor 1765 to SC-H mode.

Test point: VIDEO OUT connector/camera side

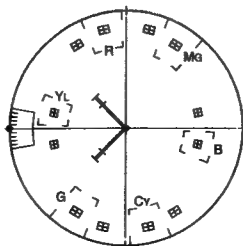
Adjustment Procedure:

- SERVICE menu "PAGE 8" → SC-H
- Adjust the phase relationship between SC (Burst) and H beam spot correctly by turning the MENU dial, then store the data by pushing the MENU dial.

[for NTSC]



[for PAL]



Note: After this adjustment, set the mode of Tektronix Waveform monitor 1765 to "WFM" mode.

10-3-3. Y/R-Y/B-Y CLP Level Adjustment

Equipment: Oscilloscope

To be extended: ES-26/26P board

Preparation: OUTPUT/DL/DCC+ switch/camera side → BARS

- S401/ES-26/26P setting : → CCZ ON
- Measure the levels at TP393, TP395, and TP397 after the termination with 75 Ω resistor.

Trigger: HD (TP349/extension board)

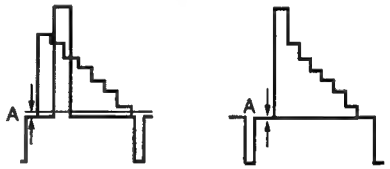
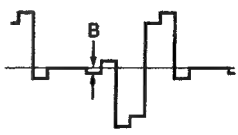
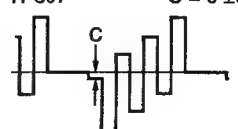
Adjustment Procedure:

- Select "PAGE 12" of SERVICE menu, make sure that R-Y and B-Y mode are both "ON".
- SERVICE menu "PAGE 6"
 → Y CLP :
 R-Y CLP :
 B-Y CLP :
- Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.

Note: In case of Y CLP for NTSC model, perform the following adjustments:

- Select "PAGE 9" of SERVICE menu, and set the "SETUP" to "OFF."
- Select "PAGE 6" of SERVICE menu, and move the cursor to Y CLP.
- Adjustment: A = 0 \pm 5 mV
- Select "PAGE 9" of SERVICE menu, and set the "SETUP" to "ON."
- And return to "PAGE 6."

Extension board (GND : TP394/ES-26/26P board)

Item	Test Point	Specification
Y CLP	TP393 (NTSC) (PAL)	A = 0 \pm 5 mV
		
R-Y CLP	TP395	B = 0 \pm 5 mV
		
B-Y CLP	TP397	C = 0 \pm 5 mV
		

Note: After adjustment, set the S401 switch to NORM.

10-3-4. Y/SYNC/R-Y/B-Y Level Adjustment

Equipment: Oscilloscope

To be extended: ES-26/26P board

Preparation: OUTPUT/DL/DCC+ switch/camera side
→ BARS

- S401/ES-26/26P setting : → CCZ ON
- Measure the levels at TP393, TP395, and TP397 after the termination with 75 Ω resistor.

Trigger: HD (TP349/extension board)

Adjustment Procedure:

1. Select "PAGE 9" of ADVANCE menu, set "16:9/4:3" to "16:9".
2. Select "PAGE 12" of SERVICE menu, make sure that TEST is "OFF", and R-Y and B-Y mode are all "ON".
3. SERVICE menu "PAGE 5"
→ W Y LEV :
W R-Y LEV :
W B-Y LEV :
SYNC LEV :
SET UP LEV :
4. Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.
5. Select "PAGE 9" of ADVANCE menu, and set "16:9/4:3" to "4:3".
6. SERVICE menu "PAGE 5"
→ Y LEV :
R-Y LEV :
B-Y LEV :
SYNC LEV :
SET UP LEV :
7. Adjust the following items by UP ▲ switch or DOWN ▼ switch.

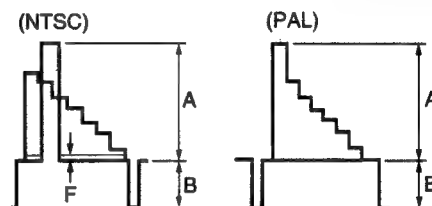
Note: In case of Y LEV for NTSC model, perform the adjustment as follows.

- ① Move the cursor to Y LEV.
- ② Adjust the "A" of Y LEV level.
- ③ Move the cursor to SETUP LEV, and adjust the "F" of setup level.
- ④ Repeat item ① through ③ several times.

8. Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.

Extension board (GND : TP394/ES-26/26P board)

Item	Test Point	Specification
W Y LEV	TP393	NTSC : A = 714 ± 10 mV F = 54 ± 5 mV PAL : A = 700 ± 10 mV
Y LEV	TP393	NTSC : A = 714 ± 10 mV F = 54 ± 5 mV PAL : A = 700 ± 10 mV
SYNC LEV	TP393	NTSC : B = 286 ± 5 mV PAL : B = 300 ± 5 mV



W R-Y LEV	TP395	NTSC : 700 ± 20 mV PAL : 525 ± 20 mV
R-Y LEV	TP395	NTSC : 700 ± 20 mV PAL : 525 ± 20 mV



W B-Y LEV	TP397	NTSC : 700 ± 20 mV PAL : 525 ± 20 mV
B-Y LEV	TP397	NTSC : 700 ± 20 mV PAL : 525 ± 20 mV



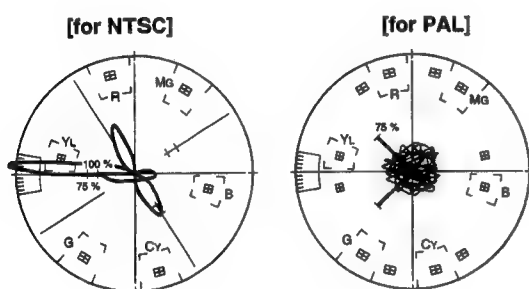
Note: After adjustment, set the S401 switch to NORM.

10-3-5. Carrier Balance Adjustment

Equipment: Vectorscope (MAX GAIN)
Preparation: OUTPUT/DL/DCC+ switch/camera side → BARS
Test point: VIDEO OUT connector/camera side

Adjusting point:

- SERVICE menu "PAGE 7"
 → R-Y C/B :
 B-Y C/B :
- Move the cursor to R-Y C/B or B-Y C/B with STATUS/MENU switch, and adjust the beam spot so that it is in the center of the vectorscope by turning the MENU dial, then store the data by pushing the MENU dial.



10-3-6. Chroma (VBS) Level Adjustment

Note: Be sure to use the specified vectorscope which is conformed to the SET UP 0 function.

Equipment: Vectorscope
To be extended: ES-26/26P board
Preparation:

- GAIN switch/Vectorscope → 75 % CAL
 - Adjust the PHASE control on the vectorscope so that the burst spot is overlapped with the 75 % axis.
 - OUTPUT/DL/DCC+ switch/camera side → BARS
- Test point:** VIDEO OUT connector/camera side

Adjustment Procedure:

- [for NTSC] • SERVICE menu "PAGE 7"
 → B-Y BST :

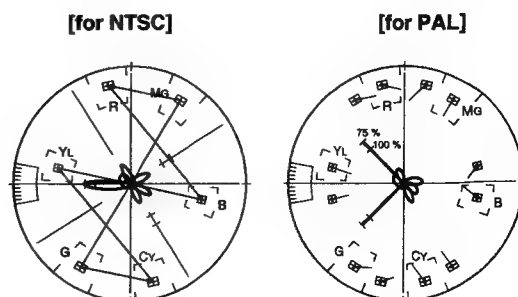
Note: In case of NTSC, make sure that "R-Y BST" must be "0".

- Adjust the burst spot so that it is located at 75 % scale mark on the vectorscope screen by turning the MENU dial, then store the data by pushing the MENU dial.

- [for PAL] • SERVICE menu "PAGE 7"
 → R-Y BST :
 B-Y BST :

- Adjust "R-Y BST" and "B-Y BST" alternately so that burst spot is located at 75 % scale mark on the vectorscope screen by turning the MENU dial, then store the data by pushing the MENU dial.

- Adjust the following controls alternately so that each beam spot stays inside the reference frame "E".
 ●RV103 (B-Y LEV)/ES-26/26P board
 ●FL101 (PHASE)/ES-26/26P board
 ●RV101 (CHROMA VBS LEV)/ ES-26/26P board
- Then, perform above procedure item 1 again.



10-3-7. Y (VBS) Level Adjustment

Equipment: Waveform monitor

To be extended: ES-26/26P board

Preparation: OUTPUT/DL/DCC+ switch/camera side
→ BARS

Test point: VIDEO OUT connector/camera side

Adjustment Procedure:

1. for NTSC

- SERVICE menu "PAGE 11"

→ SET UP: ON

MAT DEST: SMPTE

- SERVICE menu "PAGE 5"

→ SETUP LEV:

Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.

Specification: A = 7.5 ± 0.5 IRE (See below waveform)

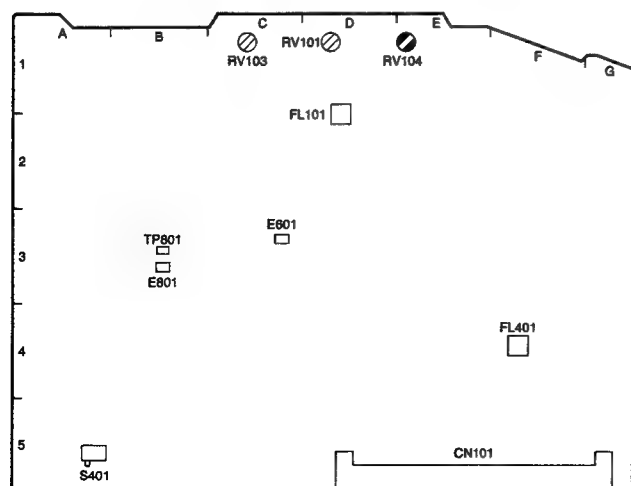
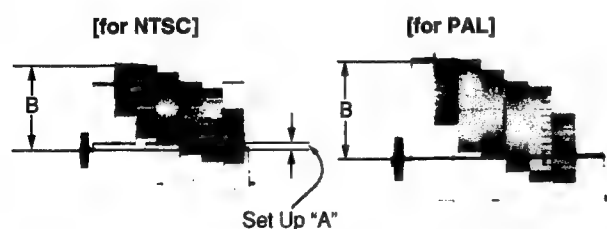
for PAL

- SERVICE menu "PAGE 11"

→ COMP LEV: 525 (not 700)

2. Adjusting point: RV104 (Y LEVEL)/ES-26/26P board

Specification: for NTSC B = 100 ± 2 IRE
for PAL B = 700 ± 10 mV



ES-26/26P BOARD (A SIDE)

10-3-8. VF SYNC/BLKG Level Adjustment

Equipment: Oscilloscope

To be extended: ES-26/26P board

Preparation: OUTPUT/DL/DCC+ switch/camera side
→ BARS

- If no viewfinder (DXF-701) is connected, terminate TP325 with 3 kΩ resistor.

Trigger: HD (TP349/extension board)

Adjustment Procedure:

1. SERVICE menu "PAGE 7"

→ VF SYNC

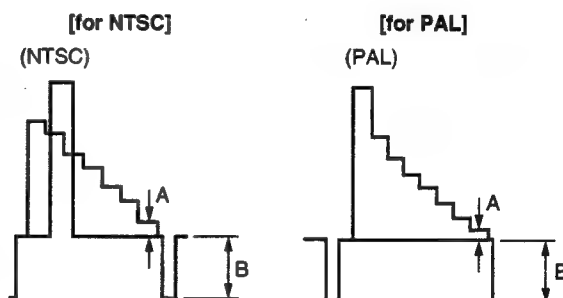
VF BLKG

Note: First, perform "VF BLKG" adjustment, then "VF SYNC" adjustment.

2. Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.

Extension board (GND: TP326)/ES-26/26P board

Item	Test Point	Specification
VF BLKG	TP325	A = 50 ± 10 mV
VF SYNC	TP325	NTSC: B = 290 ± 10 mV PAL: B = 300 ± 10 mV



10-3-9. CCD Output Level Adjustment

- Note:**
- Usually, this adjustment is not required except when the output level of CCD unit is remarkably different from the specified level.
 - As a replacement CCD unit is precisely adjusted at the factory, it is not necessary to perform this adjustment when the CCD unit had been replaced with a new one.

Light: 3200 K, 2000 lux
(If the designated pattern box is used, set the AUTO mode.)

Object: Grayscale chart

Equipment: Oscilloscope

Preparation:

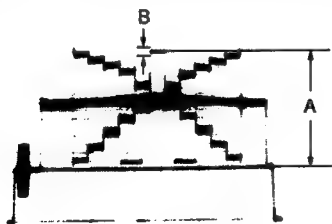
- OUTPUT/DL/DCC+ switch/camera side
→ CAM/DCC+
- WHITE BAL switch: PRESET
- Chart frame = Underscanned monitor frame
- FILTER knob: 1 (3200 K)
- Open the VA-190 board.

Test point: VIDEO OUT/camera side

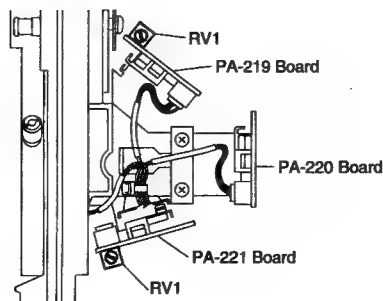
Adjustment Procedure:

1. Adjust the lens iris so that the white level "A" is as follows:
for NTSC: $A = 90 \pm 10$ IRE
for PAL: $A = 630 \pm 70$ mV
2. Adjust the following controls alternately to minimize the carrier leakage "B."

- RV1/PA-219 (B) board
 - RV1/PA-221 (R) board
- } Adjust alternately



Note: Set "PAGE 3: PRE.WHT" of ADVANCE menu to 3200.



10-3-10. Black Level Adjustment

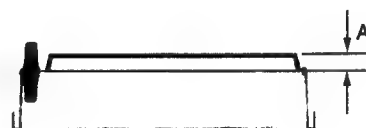
Equipment: Waveform monitor

Test point: VIDEO OUT/Camera side

Adjustment Procedure:

1. SERVICE menu "PAGE 17"
→ M. BLACK:
2. Close the lens iris.
3. Push down the "W/B" switch on the camera to "BLK" side.
4. Perform adjustment by turning the MENU dial, then store the data by pushing the MENU dial.

Specification : $A = 10 \pm 1$ IRE (for NTSC)
 20 ± 7 mV (for PAL)



10-3-11. Carrier Adjustment when (Dual Pixel Readout) is On

Equipment: Waveform monitor/vector scope (MAX GAIN)

Preparation: • Switch in cover → HYPER GAIN ON
• OUTPUT/DL/DCC+ switch/camera side → CAM DCC+

Test point: VIDEO OUT connector/camera side.

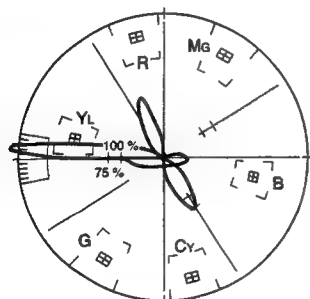
Adjustment Procedure:

- SERVICE MENU "PAGE 27"
→ RD. DARK :
GD. DARK :
BD. DARK :
- Close the lens iris.
- Adjustment the setting value of RD. DARK/GD. DARK/BD. DARK by turning the MENU dial to meet the specifications 1 and 2.

Specification 1 : $A = 10 \pm 1$ IRE (for NTSC)
 20 ± 7 mV (for PAL)



Specification 2 : The beam spot of black level is in the center position on the vector scope screen.



- Store the data by pushing the MENU dial.
- Confirm to meet the specifications 1 and 2 at GAIN 0 dB.

10-3-12. Shading Adjustment

Note: Perform this adjustment when using the other lens, or replacing the CCD unit.

Object: White portion of pattern box

Equipment: Waveform monitor, Oscilloscope

To be extended: VA-190 board

Trigger: VD (TP2/VA-190 board)

Preparation:

[When replacing CCD unit]

Attach the lens VCL-918BY or equivalent to the unit.
(Refer to Section 5. Adjusting the Lens <Designating the lens> in the operating instructions.)

Set LENS SEL in "PAGE 4" of ADVANCE menu to No.1, then set the data according to adjustment procedure. The data values of LENS SEL 2,3 and 4 shall be set by adding the value of following table based on the data values of R, G and B of LENS SEL1.

LENS SEL	EXTENDER OFF			EXTENDER ON		
	R	G	B	R	G	B
1 (standard)						
2	-15	10	-15	0	0	0
3	-25	20	-25	0	0	0
4	0	0	0	0	0	0

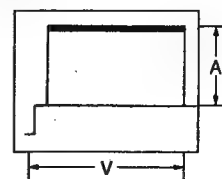
additional value

[When replacing lens]

Set LENS SEL in "PAGE 4" of ADVANCE menu to No.4, then set the data according to adjustment procedure.


Adjustment Procedure:

- SERVICE menu "PAGE2"
→ R W.SHAD:
G W.SHAD:
B W.SHAD:
- Shoot the center portion of pattern box by zooming the lens to fully TELE position.
In case of using the lens with extender, set the extender to off.
- Adjust the lens iris so that the level "A" is 70 ± 2 IRE for NTSC (for PAL: 490 ± 14 mV) on the VIDEO OUT connector of camera.



Waveform monitor

- In the following mode, perform adjustment by turning the MENU dial until the waveform on oscilloscope becomes flat. After adjustment, store the data by pushing the MENU dial.

Mode	Test point (VA-190 board)	Spec.
R W.SHAD	TP102	
G W.SHAD	TP202	
B W.SHAD	TP302	
GND: E2/VA-190 board		

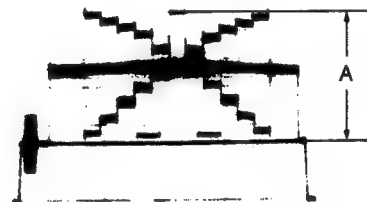
- In case of using the lens with extender, set the extender to ON, then perform the adjustment of step 4.

10-3-13. Flare Adjustment

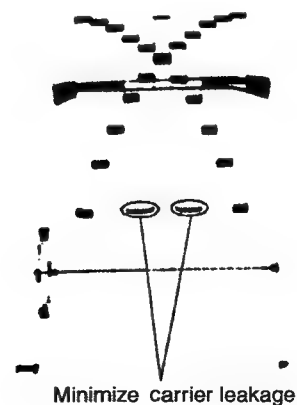
Object: Grayscale chart
Equipment: Waveform monitor

Adjustment Procedure

- SERVICE menu "PAGE 3"
→ R FLARE: x
G FLARE: 10
B FLARE: x
* Leave G FLARE "10."
- Chart frame = Underscanned monitor frame
- Test point:** VIDEO OUT connector/camera side
Adjusting point: Lens iris
Specification: A = 100 ± 2 IRE (for NTSC)
 700 ± 10 mV (for PAL)



- Open the lens iris by two steps.
- Adjust "R FLARE" and "B FLARE" alternately by turning MENU dial until the carrier leakage level is minimum, then store the data by pushing the MENU dial.



10-3-14. Character Position Adjustment

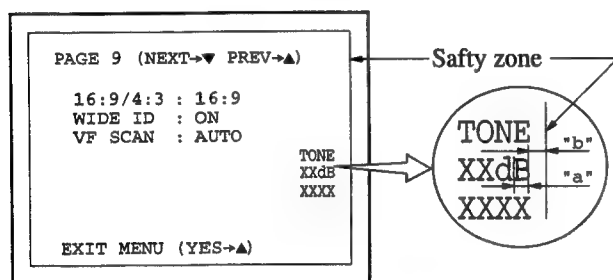
Equipment: Color monitor (or, B/W monitor)

Preparation: OUTPUT/DL/DCC+ switch/camera side
→ BARS

Test point: MONITOR OUT connector/camera side

Adjustment Procedure:

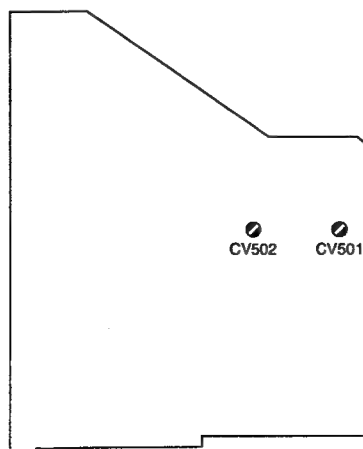
1. Set the "MARKER" to "ON" on the BASIC menu.
2. Set the "MARKER" to "CENT/90 %" on the "PAGE 4" of ADVANCE menu.
3. Select "PAGE 9" on the ADVANCE menu, set "16:9/4:3" to "16:9" position.



4. **Adjusting point:** CV502/AT-127 board

Specification: "a" \approx "b"

(The space between "a" and "b" are nearly equal)



AT-127 BOARD -A SIDE-

10-3-15. 4:3 Title Adjustment

Equipment: Color monitor (or, B/W monitor)

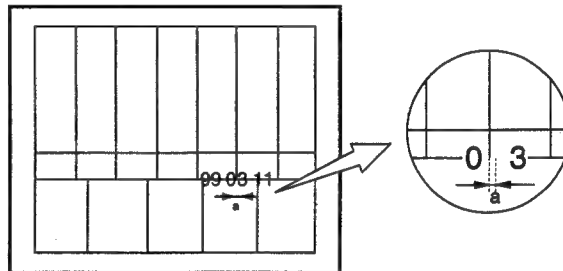
Preparation: OUTPUT/DL/DCC+ switch/camera side
→ BARS

Test point: MONITOR OUT connector/camera side

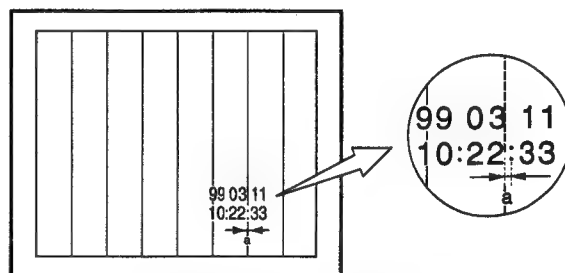
Adjustment Procedure:

1. Set the "MARKER" to "ON" on the BASIC menu.
2. Set the "MARKER" to "CENT/90 %" on the "PAGE 4" of ADVANCE menu.
3. Select "PAGE 9" on the ADVANCE menu, set "16:9/4:3" to "4:3" position.
4. Select "PAGE 8" on the ADVANCE menu, set "CLOCK IND" to "CAM".
5. The day and time will be displayed when exiting from the menu.
6. **Adjusting point:** CV501/AT-127 board
Specification: "a" \approx 0

[for NTSC] (The line of color bar shall touch the number.)



[for PAL] (The line of color bar shall touch the colon.)



Note : After adjustment, set the clock "T" for the present time.

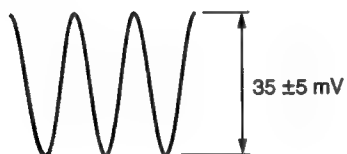
10-3-16. TONE Level Adjustment

Equipment: Oscilloscope

Preparation: OUTPUT/DL/DCC+ switch/camera side
→ BARS

Adjustment Procedure:

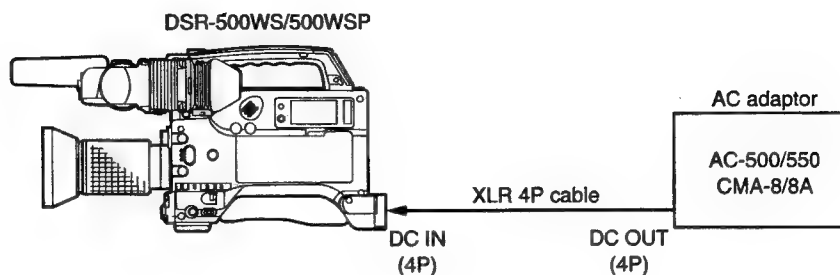
1. Open the AT-127 board.
 2. **Test point:** R417 (0 Z)/FP-118 board
(GND: E2/FP-118 board)
- Adjusting point:** RV201/AA-104 board



SECTION 11

VTR BLOCK ELECTRICAL ALIGNMENT

SYSTEM CONNECTION



SWITCH SETTING

• SIDE Panel

EZ MODE:	OFF
ATW:	OFF
ZEBRA:	OFF
GAIN:	L
OUTPUT:	BARS
W.BAL:	PRE
SKIN DTL:	OFF
EXT VTR OUTPUT:	COMPONENT, VBS
HYPER GAIN:	OFF
MATRIX:	STD
FRONT MIC LOW CUT:	OFF
VTR TRIGGER:	INT ONLY
MONITOR SELECT:	MIX
TC MODE 1:	PRESET
TC MODE 2:	F-RUN
MONITOR OUT CHARACTER:	OFF
AUDIO SELECT CH-1/CH-2:	MAN
AUDIO IN CH-1/CH-2:	REAR
DISPLAY:	TC

AUDIO LEVEL VR CH-1/CH-2:	CCW
MONITOR VR:	CCW
ALARM VR:	CW

• REAR Panel

AUDIO IN CH-1/CH-2:	LINE
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11-1. SYSTEM CONTROL ADJUSTMENT

Equipment Required

- Frequency counter (IWATSU SC-7102 or equivalent)
- DC power supply (SONY AC-500/550 or CMA-8/8A)

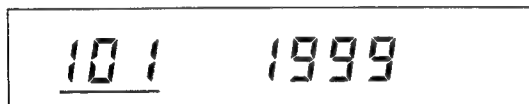
11-1-1. Clock Frequency Adjustment

Equipment: Frequency Counter
Preparation:

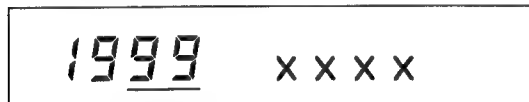
- Input Singal (No signal)
- EE mode

Adjustment Procedure

1. Press the MENU button once.
The following message is displayed on the LCD screen.
(In the following description, an underlined part indicates a portion of the display which is blinking.)

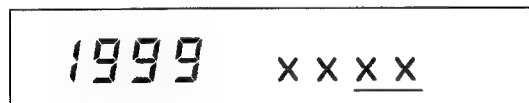


2. Press the SHIFT button once.
The following message is displayed on the LCD screen.

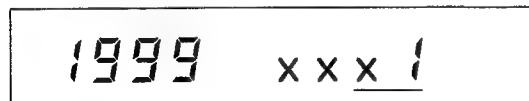


3. Confirm that rightmost digit is 1.
If not, set it to 1 by following the procedure.

- ① Press the SHIFT button to blink the underlined digits.

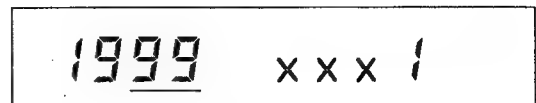


- ② Press the ADVANCE button to set the rightmost digit to 1.

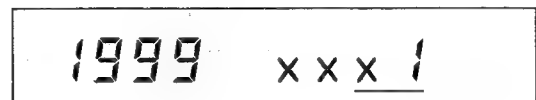


- ③ Press the SHIFT button seven times.

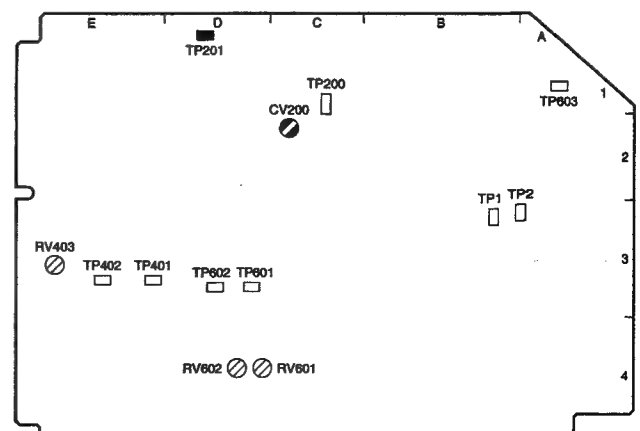
The following message is displayed on the LCD screen.



Note: Be sure not to blink the underlined part.



4. Perform the following adjustment:
Test point: TP201/FP-118 Board (D-1)
Adjusting point: CV200/FP-118 Board (C-2)
Specification: 256.0025 ±0.0005 Hz
5. Press the MENU button, and exit from the maintenance menu.



FP-118 BOARD (B SIDE)

11-2. SERVO SYSTEM ADJUSTMENT

Equipment Required

DC power supply (SONY AC-500/550 or CMA-8/8A)

11-2-1. Capstan FG Duty Adjustment

Adjustment Procedure

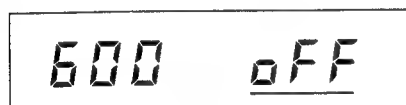
1. Check that there is no tape in the unit.
2. Close the cassette compartment when it is opened. (It is not necessary to reinstall the cassette compartment if it is removed.)
3. Set the unit in maintenance menu, and select menu No. 601.

- (1) While pressing the SHIFT button, press the MENU button, then release the SHIFT button, and press the MENU button for more than one second.
The following message is displayed on the LCD screen.
(In the following description, an underlined part indicates a portion of the display which is blinking.)



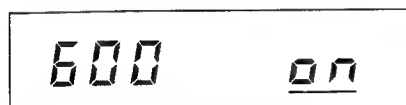
- (2) Press the RESET (MENU SET) button once to blink "oFF."

The following message is displayed on the LCD screen.



Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once to select "on."
The following message is displayed on the LCD screen.



Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

- (4) Press the RESET (MENU SET) button once.

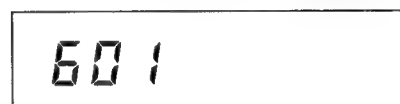
The following message is displayed on the LCD screen.



Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button once to display menu No. 601.

The following message is displayed on the LCD screen.



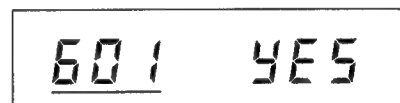
Each time the ADVANCE button is pressed, the menu No. will change as follows:

600 → 601 → 603 → ... 513 → 600 → 601 → ...

Each time the SHIFT button is pressed, the menu No. will change as follows:

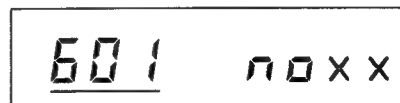
600 → 513 → 509 → ... 601 → 600 → 513 → ...

4. Press the RESET (MENU SET) button.
5. Check that the capstan is rotating, and wait for a while (Up to 60 seconds).
6. Check that the following message is displayed on the LCD screen.



When the following message is displayed on the LCD screen, exit from menu No. 601, and perform step 3 and onwards.

If it is still shown on the LCD screen, check whether the unit is normal or not.



- XX: 10 → The capstan does not rotate
11 → The capstan FG (A) cannot be adjusted
12 → The capstan FG (B) cannot be adjusted
E0 → Cannot save data
Fd → Not supported menu
FE → Prohibits adjustments (Ex.: Tape is inserted)

7. Press the MENU button, and exit from the maintenance menu.

The state before the maintenance menu indication will be displayed on the LCD screen.

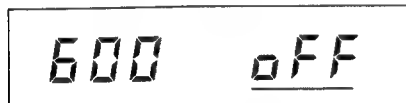
11-2-2. Reel FG Duty Adjustment

Adjustment Procedure

1. Check that there is no tape in the unit.
2. Close the cassette compartment when it is opened. (It is not necessary to reinstall the cassette compartment if it is removed.)
3. Set the unit in maintenance menu, and select menu No. 607.
- (1) While pressing the SHIFT button, press the MENU button, then release the SHIFT button, and press the MENU button for more than one second.
The following message is displayed on the LCD screen.
(In the following description, an underlined part indicates a portion of the display which is blinking.)



- (2) Press the RESET (MENU SET) button once to blink "oFF."
The following message is displayed on the LCD screen.



Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once to select "on."
The following message is displayed on the LCD screen.



Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

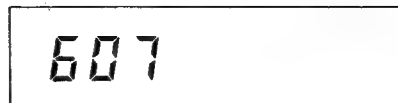
- (4) Press the RESET (MENU SET) button once.
The following message is displayed on the LCD screen.



Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several times to display menu No. 607.

The following message is displayed on the LCD screen.



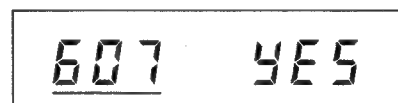
Each time the ADVANCE button is pressed, the menu No. will change as follows.

600 → 601 → 603 → ... 513 → 600 → 601 → ...

Each time the SHIFT button is pressed, the menu No. will change as follows.

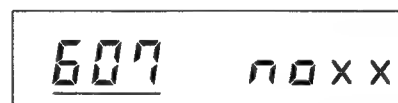
600 → 513 → 509 → ... 601 → 600 → 513 → ...

4. Press the RESET (MENU SET) button.
5. Check that the reel motor is rotating, and wait for a while
(Up to 60 seconds).
6. Check that the following message is displayed on the LCD screen.



When the following message is displayed on the LCD screen, exit from menu No. 607, and perform step 3 and onwards.

If it is still shown on the LCD screen, check whether the unit is normal or not.



XX: 20 → The reel motor does not rotate
21 → The reel FG cannot be adjusted
E0 → Cannot save data
Fd → Not supported menu
FE → Prohibits adjustments (Ex.: Tape is inserted)

7. Press the MENU button, and exit the maintenance menu.
The state before the maintenance menu indication will be displayed on the LCD screen.

11-3. RF SYSTEM ADJUSTMENT

11-3-1. REC Current Adjustment

Note: Be sure to perform this adjustment when the RP-91 board is repaired and recording amplifier (IC777) or EEPROM (IC770) on the board is replaced.

Be sure not to perform this adjustment when replacing the RP-91 board.

1. Set the unit in maintenance menu, and select Menu No. 700.
- (1) While pressing the SHIFT button, press the MENU button, then release the SHIFT button, and press the MENU button for more than one second.
The following message is displayed on the LCD screen.
(In the following description, an underlined part indicates a portion of the display which is blinking.)

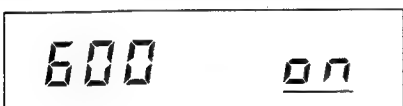


- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.
The following message is displayed on the LCD screen.



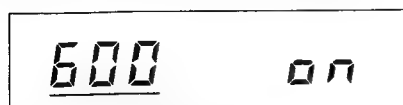
Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on".
The following message is displayed on the LCD screen.



Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

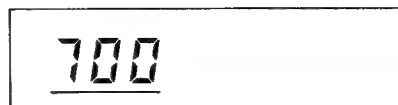
- (4) Press the RESET (MENU SET) button once.
The following message is displayed on the LCD screen.



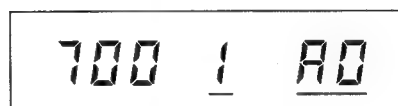
Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several times and display Menu No. 700.

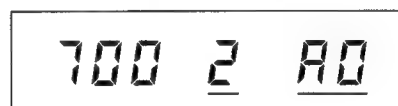
The following message is displayed on the LCD screen.



2. Press the RESET (MENU SET) button.
3. Check that the following message is displayed on the LCD screen:



4. Press the RESET (MENU SET) button.
5. Check that the following message is displayed on the LCD screen:

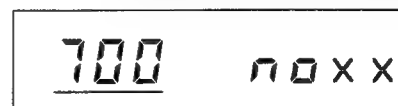


6. Press the RESET (MENU SET) button.
7. Check that the following message is displayed on the LCD screen:



If the following message is displayed on the LCD screen, exit from Menu No. 700, and perform from step 1 again.

If the following message is still shown on the LCD screen, check whether the unit is normal or not.



X X:EO→ Cannot save data

8. Press the MENU button, and exit from the maintenance menu.
The state before the maintenance menu indication will be displayed on the LCD screen.

11-3-2. PLL Adjustment

Note: Be sure to perform this adjustment when the RP-91 board is repaired and PLL (IC773) or EEPROM (IC770) on the RP-91 board is replaced.

Be sure not to perform this adjustment when replacing the RP-91 board.

1. Set the unit in the maintenance menu, and select Menu No. 701.

- (1) While pressing the SHIFT button, press the MENU button, then release the SHIFT button, and press the MENU button for more than one second.

The following message is displayed on the LCD screen. (In the following description, an underlined part indicates a portion of the display which is blinking.)

600 oFF

- (2) Press the RESET (MENU SET) button once to blink "oFF."

The following message is displayed on the LCD screen.

600 oFF

Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on."

The following message is displayed on the LCD screen.

600 on

Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

- (4) Press the RESET (MENU SET) button once.

The following message is displayed on the LCD screen.

600 on

Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several times and display Menu No. 701.

The following message is displayed on the LCD screen.

701

2. Press the RESET (MENU SET) button.
3. Load a blank tape, and wait for a while (8 minutes or less).
4. Eject the blank tape.
5. Check that the following message is displayed on the LCD screen:

701 YES

If the following message is displayed on the LCD screen, exit from Menu No. 701 and perform from step 1 again.

If the following message is still shown on the LCD screen, check the replaced IC and/or adjacent circuitry.

701 noXX

X X: 42 → Could not record time required for adjustment or check

43 → Could not find starting point of recording

45 → CLOCK DELAY cannot be adjusted

50 → PLL F0 (CH1) cannot be adjusted

51 → PLL F0 (CH2) cannot be adjusted

52 → PLL capture range cannot be adjusted

E0 → Cannot save data

Fb → Operation mode changed during adjustment or check. Or could not record

Fc → Error occurred during adjustment or check

Fd → Not supported menu

FE → Prohibits adjustments (Ex.: Tape is inserted)

Note: Because the recording in the special mode is performed during adjustments, the tape used in this adjustment cannot be played back properly.

6. Press the MENU button, and exit from the maintenance menu.

The state before the maintenance menu indication will be displayed on the LCD screen.

11-3-3. AGC and Delay Adjustment

Note: Be sure to perform this adjustment when the RP-91 board is repaired and AEQ (IC775) or EEPROM (IC770) on the RP-91 board is replaced.

Be sure not to perform this adjustment when replacing the RP-91 board.

1. Set the unit in maintenance menu, and select Menu No. 702.

- (1) While pressing the SHIFT button, press the MENU button, then release the SHIFT button, and press the MENU button for more than one second.
The following message is displayed on the LCD screen.
(In the following description, an underlined part indicates a portion of the display which is blinking.)

600 oFF

- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.
The following message is displayed on the LCD screen.

600 oFF

Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on."
The following message is displayed on the LCD screen.

600 on

Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

- (4) Press the RESET (MENU SET) button once.
The following message is displayed on the LCD screen.

600 on

Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several times and display Menu No. 702.

The following message is displayed on the LCD screen.

702

2. Press the RESET (MENU SET) button.
3. Load a blank tape, and wait for a while (10 minutes or less).
4. Eject the blank tape.
5. Check that the following message is displayed on the LCD screen:

702 YES

If the following message is displayed on the LCD screen, exit from Menu No. 702 and perform from step 1 again.

If the following message is still shown on the LCD screen, check the replaced IC and/or adjacent circuitry.

702 noXX

- XX: 40 → EQ cannot be adjusted
 41 → Fault detected when error rate was checked after adjustment
 42 → Could not record time required for adjustment or check
 43 → Could not find starting point of recording
 44 → AGC LEVEL cannot be adjusted
 45 → CLOCK DELAY cannot be adjusted
 E0 → Cannot save data
 Fb → Operation mode changed during adjustment or check. Or could not record
 Fc → Error occurred during adjustment or check
 Fd → Not supported menu
 FE → Prohibits adjustments (Ex.: Tape is inserted)

Note: Because the recording in the special mode is performed during adjustments, the tape used in this adjustment cannot be played back properly.

6. Press the MENU button, and exit from the maintenance menu.
The state before the maintenance menu indication will be displayed on the LCD screen.

11-3-4. AUTO EQ Adjustment

1. Set the unit in maintenance menu, and select Menu No. 704.

- (1) While pressing the SHIFT button, press the MENU button, then release the SHIFT button, and press the MENU button for more than one second.
The following message is displayed on the LCD screen.
(In the following description, an underlined part indicates a portion of the display which is blinking.)

600 oFF

- (2) Press the RESET (MENU SET) button once so that "oFF" blinks.
The following message is displayed on the LCD screen.

600 oFF

Each time the RESET (MENU SET) button is pressed, "600" and "oFF" will blink alternately.

- (3) Press the ADVANCE button once, and select "on."
The following message is displayed on the LCD screen.

600 on

Each time the ADVANCE button is pressed, "on" and "oFF" will blink alternately.

- (4) Press the RESET (MENU SET) button once.
The following message is displayed on the LCD screen.

600 on

Each time the RESET (MENU SET) button is pressed, "600" and "on" will blink alternately.

- (5) Press the ADVANCE button several time to display Menu No. 704 on the LCD screen.
The following message is displayed on the LCD screen.

704

2. Press the RESET (MENU SET) button.
3. Load a blank tape, and wait for a while (6 minutes or less).
4. Eject the blank tape.
5. Check that the following message is displayed on the LCD screen:

704 YES

If the following message is displayed on the LCD screen, exit from Menu No. 704 and perform from step 1 again.

If the following message is still shown on the LCD screen, check whether the unit is normal or not.

704 noXX

- X X: 40 → EQ cannot be adjusted
 41 → Fault detected when error rate was checked after adjustment
 42 → Could not record time required for adjustment or check
 43 → Could not find starting point of recording.
 E0 → Cannot save data
 Fb → Operation mode changed during adjustment or check. Or could not record
 Fc → Error occurred during adjustment or check.
 Fd → Not supported menu
 FE → Prohibits adjustments (Ex.: Tape is inserted)

Note: Because the recording in the special mode is performed during adjustments, the tape used in this adjustment cannot be played back properly.

6. Press the MENU button, and exit from the maintenance menu.

The state before the maintenance menu indication will be displayed on the LCD screen.

11-4. AUDIO SYSTEM ADJUSTMENT

Equipment Required

- Audio signal generator (HEWLETT PACKARD HP8904 or equivalent)
- Audio level meter (HEWLETT PACKARD HP3400A or equivalent)
- DC power supply (SONY AC-500/550 or CMA-8/8A)
- Blank tape (SONY DVM30-ME, DVM30-NME or equivalent)
- Alignment tape XH5-1A (SONY Part No. 8-967-999-21: for DSR-500WS)
- Alignment tape XH5-1AP (SONY Part No. 8-967-999-25: for DSR-500WSP)

Alignment Tape Contents

XH5-1A (SONY Part No. 8-967-999-21: for DSR-500WS)

VIDEO	TIME CODE (h) (m) (s)	REC (sec.)	AUDIO	
Black burst	23 : 59 : 00	60	No signal	
75 % full color bars	00 : 00	60	1 kHz	
60 % multi burst	01 : 00	60	20 Hz	
Bowtie with mod 12.5T	02 : 00	30	14.5 kHz	
Shallow ramp	02 : 30	30	10 kHz	
	03 : 00	30	No signal	
Cross hatch (index)	03 : 30	30	1 kHz 0 dBFS	
Line 17	04 : 00	40	1 ch	1 kHz
75 % full color bars	04 : 40	40	2 ch	
Quad phase	05 : 20	40	3 ch	
	06 : 00	40	4 ch	
Black burst	06 : 40	5	No signal	
	06 : 45	5		
60 % multi burst (for composite)	06 : 50	60	1 kHz	
Mod 12.5T	07 : 50	30	20 Hz	
Shallow ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz	
	08 : 50	30	10 kHz	
Cross hatch (index)	09 : 20	30	1 kHz 0 dBFS	
Chroma noise	09 : 50	30	1 kHz	
Line 17	10 : 20	30		
75 % full color bars	10 : 50	180		
60 % multi burst	13 : 50	60		
Mod 12.5T	14 : 50	30		
Shallow ramp	15 : 20	60		
75 % full color bars	16 : 20	100		
75 % full color bars (R-Y OFF)	18 : 00	180		
75 % full color bars (B-Y OFF)	21 : 00	180		
Blanking marker	24 : 00	180		
Line 17 (R-Y OFF)	27 : 00	180		
Line 17 (B-Y OFF)	30 : 00	180		

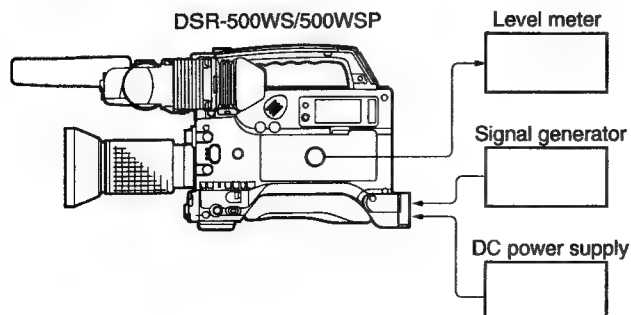
* Audio levels are -20 dBFS (Reference), except 1 kHz 0 dBFS part.

XH5-1AP (Sony Part No. 8-967-999-25; for DSR-500WSP)

VIDEO	TIME CODE (h) (m) (s)	REC (sec.)	AUDIO		
Black burst	23 : 59 : 00	60	No signal	32 kHz 4 ch	
100 % full color bars	00 : 00	60	1 kHz		
60 % multi burst	01 : 00	60	20 Hz		
Bowtie with mod 10T	02 : 00	30	14.5 kHz		
Shallow ramp	02 : 30	30	10 kHz		
	03 : 00	30	No signal		
Cross hatch (index)	03 : 30	30	1 kHz 0 dBFS		
Line 17	04 : 00	40	1 ch		1 kHz
100 % full color bars	04 : 40	40	2 ch		
Quad phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black burst	06 : 40	5	No signal		
	06 : 45	5			
60 % multi burst (for composite)	06 : 50	60	1 kHz		
Mod 10T	07 : 50	30	20 Hz		
Shallow ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma noise	09 : 50	30	1 kHz		
Line 17	10 : 20	30			
100 % full color bars	10 : 50	180			
60 % multi burst	13 : 50	60			
Mod 10T	14 : 50	30			
Shallow ramp	15 : 20	60			
100 % full color bars	16 : 20	100			
100 % full color bars (R-Y OFF)	18 : 00	180			
100 % full color bars (B-Y OFF)	21 : 00	180			
Blanking marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

* Audio levels are -18 dBFS (Reference), except 1 kHz 0 dBFS part.

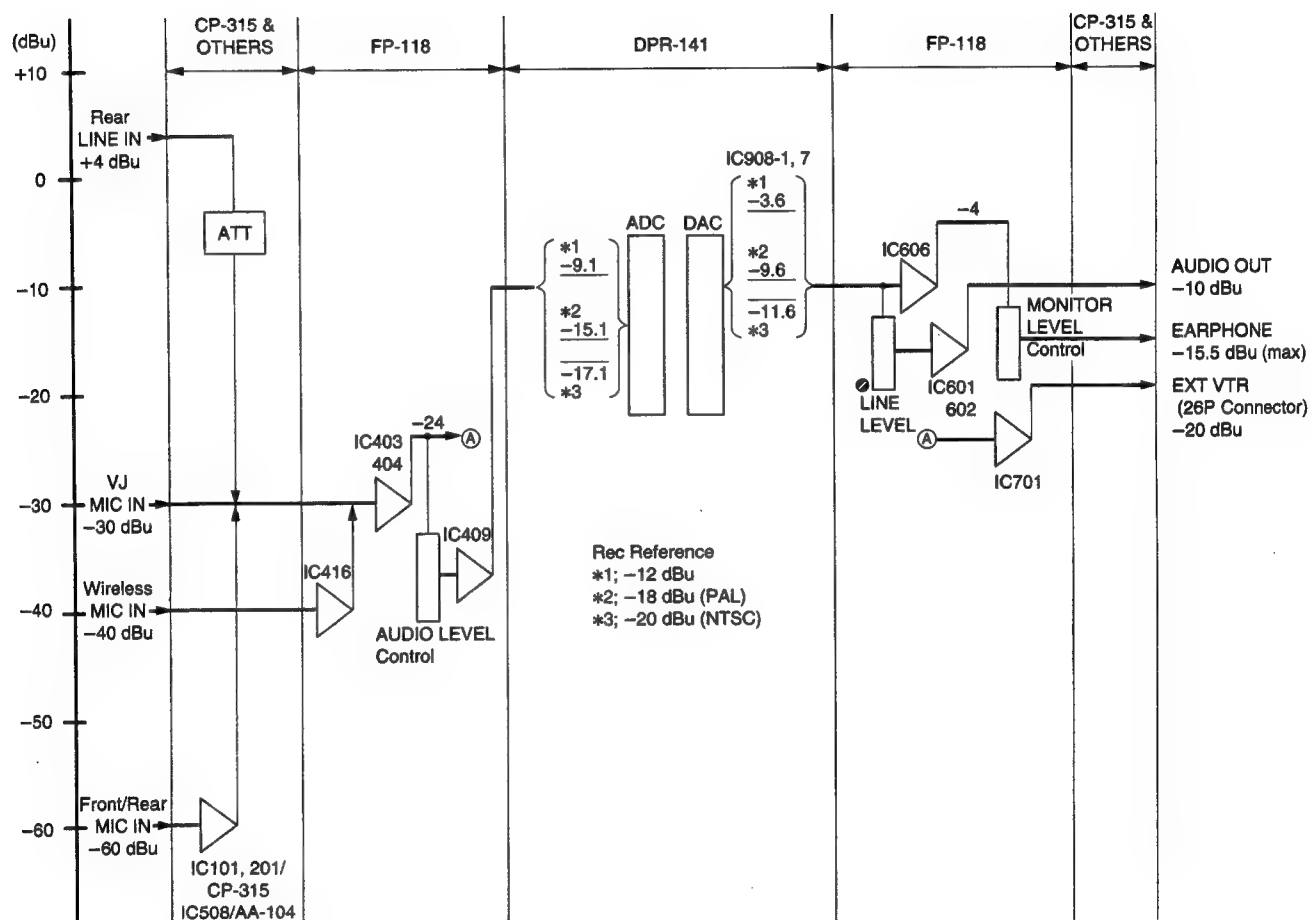
System Connection



Precautions on Adjustments

- The alignment tape can be used within the limits about 50 times. It is recommended that the tape is marked for reference.
- 0 dBu = 0.775 Vrms

Level Diagram



11-4-1. Audio Level Volume Reference Position Adjustment

Equipment: Audio level meter
Audio signal generator

Preparations: • AUDIO INPUT CH-1/CH-2: 1 kHz, +4.0 dBu
• EE mode

Test point: CH-1: TP401/FP-118 board (E-3)
CH-2: TP402/FP-118 board (E-3)

Adjusting point: CH-1 AUDIO LEVEL adjustment control
⊗RV401/FP-118 board
CH-2 AUDIO LEVEL adjustment control
⊗RV402/FP-118 board

Specification: -10.3 ± 0.2 dBu

11-4-2. Monitor Output (LINE OUT) Level Adjustment

Equipment: Audio level meter
Audio signal generator

Preparations: • AUDIO INPUT CH-1/CH-2: 1 kHz, +4.0 dBu
• Terminate the following monitor outputs with 47 k Ω resistors.
CH-1: TP601/FP-118 board
CH-2: TP602/FP-118 board
• EE mode

Test point: CH-1: TP601/FP-118 board (D-3)
CH-2: TP602/FP-118 board (D-3)

Adjusting point: CH-1: ⊗RV601/FP-118 board (D-4)
CH-2: ⊗RV602/FP-118 board (D-4)

Specification: -10.0 ± 0.5 dBu

11-4-3. Limiter Level Adjustment

Equipment: Audio level meter
Audio signal generator

Preparations: • AUDIO SELECT SW CH-1: AUTO
• AUDIO SELECT SW CH-2: AUTO
• [REAR PANEL] CH-1: LINE or MIC
• [REAR PANEL] CH-2: LINE or MIC
• EE mode

Adjusting procedure

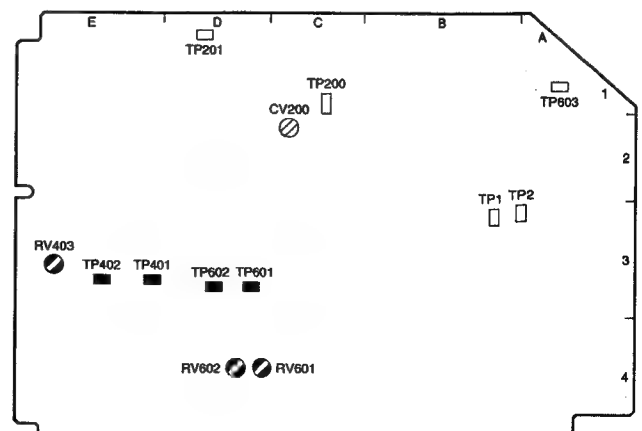
1. Input the +20 dB signal (for reference signal) to AUDIO INPUT CH-1/CH-2.
LINE: 1 kHz, +24 dBu
(Reference signal; 1 kHz, +4 dBu)
MIC: 1 kHz, -40 dBu
(Reference signal; 1 kHz, -60 dBu)

2. Adjust the level within the specification.

Test point: TP401/FP-118 board (E-3)

Adjusting point: ⊗RV403/FP-118 board (E-3)

Specification: -8.3 ± 0.2 dBu



FP-118 BOARD (B SIDE)

11-5. VIDEO SYSTEM ADJUSTMENT

Equipment Required

- Oscilloscope (Tektronix 2445B/200 MHz or equivalent)
- DC power supply (SONY AC-500/550 or CMA-8/8A)
- Alignment tape XH5-1A
(SONY Part No. 8-967-999-21 : for DSR-500WS)
- Alignment tape XH5-1AP
(SONY Part No. 8-967-999-25 : for DSR-500WSP)
- S-BNC video cable (SONY Part No. J-6381-380-A)

Precautions for Adjustments

- The alignment tape can be used within the limits for 50 times. It is recommended that the tape is marked for reference.
- Terminate at 75 Ω when measuring S-VIDEO OUT and MONITOR OUT.

Alignment Tape Contents

XH5-1A (SONY Part No. 8-967-999-21 : for DSR-500WS)

VIDEO	TIME CODE (h) (m) (s)	REC (sec.)	AUDIO		
Black burst	23 : 59 : 00	60	No signal	32 kHz 4 ch	
75 % full color bars	00 : 00	60	1 kHz		
60 % multi burst	01 : 00	60	20 Hz		
Bowtie with mod 12.5T	02 : 00	30	14.5 kHz		
Shallow ramp	02 : 30	30	10 kHz		
	03 : 00	30	No signal		
Cross hatch (index)	03 : 30	30	1 kHz 0 dBFS		
Line 17	04 : 00	40	1 ch		1 kHz
75 % full color bars	04 : 40	40	2 ch		
Quad phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black burst	06 : 40	5	No signal	48 kHz 2 ch	
	06 : 45	5			
60 % multi burst (for composite)	06 : 50	60	1 kHz		
Mod 12.5T	07 : 50	30	20 Hz		
Shallow ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma noise	09 : 50	30	1 kHz		
Line 17	10 : 20	30			
75 % full color bars	10 : 50	180			
60 % multi burst	13 : 50	60			
Mod 12.5T	14 : 50	30			
Shallow ramp	15 : 20	60			
75 % full color bars	16 : 20	100			
75 % full color bars (R-Y OFF)	18 : 00	180			
75 % full color bars (B-Y OFF)	21 : 00	180			
Blanking marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

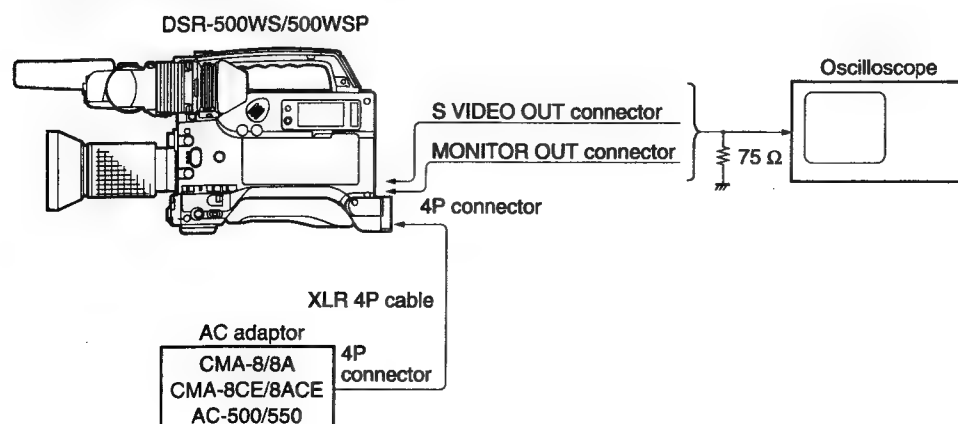
* Audio levels are -20 dBFS (Reference), except 1 kHz 0 dBFS part.

XH5-1AP (SONY Part No. 8-967-999-25 : for DSR-500WSP)

VIDEO	TIME CODE (h) (m) (s)	REC (sec.)	AUDIO	
Black burst	23 : 59 : 00	60	No signal	
100 % full color bars	00 : 00	60	1 kHz	
60 % multi burst	01 : 00	60	20 Hz	
Bowtie with mod 10T	02 : 00	30	14.5 kHz	
Shallow ramp	02 : 30	30	10 kHz	
	03 : 00	30	No signal	
Cross hatch (index)	03 : 30	30	1 kHz 0 dBFS	
Line 17	04 : 00	40	1 ch	1 kHz
100 % full color bars	04 : 40	40	2 ch	
Quad phase	05 : 20	40	3 ch	
	06 : 00	40	4 ch	
Black burst	06 : 40	5	No signal	
	06 : 45	5		
60 % multi burst (for composite)	06 : 50	60	1 kHz	
Mod 10T	07 : 50	30	20 Hz	
Shallow ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz	
	08 : 50	30	10 kHz	
Cross hatch (index)	09 : 20	30	1 kHz 0 dBFS	
Chroma noise	09 : 50	30	1 kHz	
Line 17	10 : 20	30		
100 % full color bars	10 : 50	180		
60 % multi burst	13 : 50	60		
Mod 10T	14 : 50	30		
Shallow ramp	15 : 20	60		
100 % full color bars	16 : 20	100		
100 % full color bars (R-Y OFF)	18 : 00	180		
100 % full color bars (B-Y OFF)	21 : 00	180		
Blanking marker	24 : 00	180		
Line 17 (R-Y OFF)	27 : 00	180		
Line 17 (B-Y OFF)	30 : 00	180		

* Audio levels are -18 dBFS (Reference), except 1 kHz 0 dBFS part.

System Connection



Maintenance Menu Settings

1. Press the MENU button while pressing the SHIFT button, and release the SHIFT button while pressing the MENU button. Check that "600_FF" is displayed on the LCD screen after about 1 second, and then release the MENU button.
2. Press the RESET button to blink "oFF," and press the ADVANCE button to display "on."
3. Press the RESET button to blink "600" to enable the maintenance menu, and press the ADVANCE button to display "660."
4. Press the RESET button to check the display so that it is "660_tAdj."

11-5-1. PB Y SYNC Level Adjustment

MENU No.: PAGE 10 VTR SYNC

Measuring point: S-VIDEO (Y) OUT

VTR MODE: PB

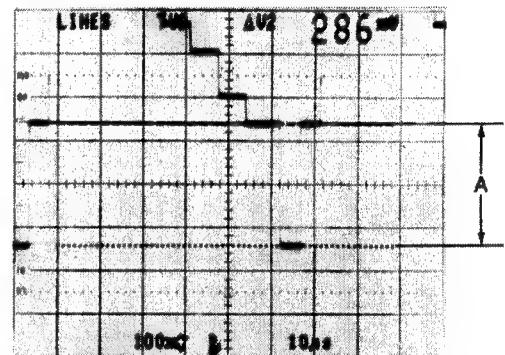
Tape: 75 % Full Color bars/XH5-1A
100 % Full Color bars/XH5-1AP

Specification: DSR-500WS : $A = 286 \pm 4$ mV
DSR-500WSP : $A = 300 \pm 4$ mV

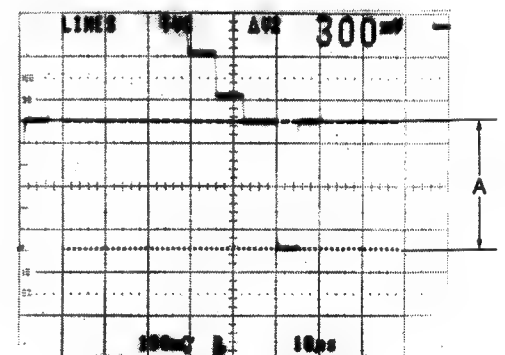
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



11-5-2. PB Y Level Adjustment

MENU No.: PAGE 9 VTR Y

Measuring point: S-VIDEO (Y) OUT

VTR MODE: PB

Tape: 75 % Full Color bars/XH5-1A
100 % Full Color bars/XH5-1AP

Specification: Y LEVEL

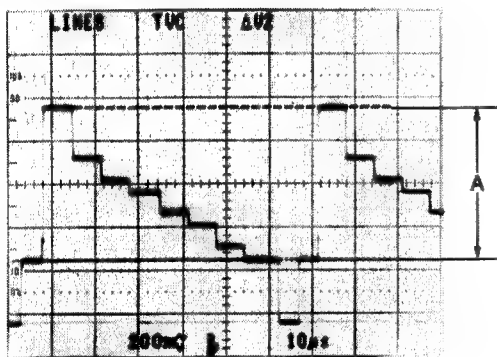
DSR-500WS : $A = 714 \pm 5 \text{ mV}$

DSR-500WSP : $A = 700 \pm 5 \text{ mV}$

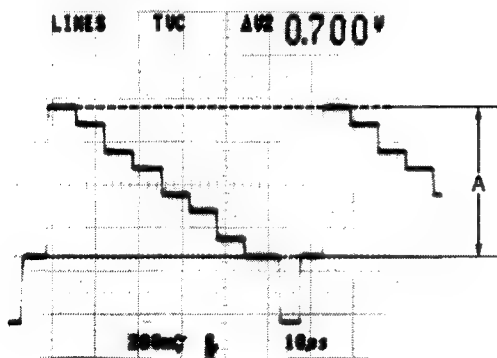
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



11-5-3. PB Y/B-Y Delay Adjustment

For DSR-500WS

MENU No.: PAGE 9 B-Y DELAY

Measuring point: MONITOR OUT

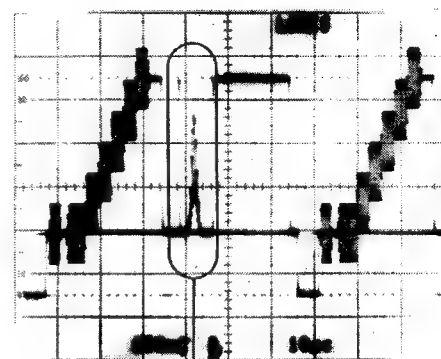
VTR MODE: PB

Tape: Line 17 (R-Y off)/XH5-1A

Specification: Adjust the envelope so that it is symmetrical on the left and right sides.

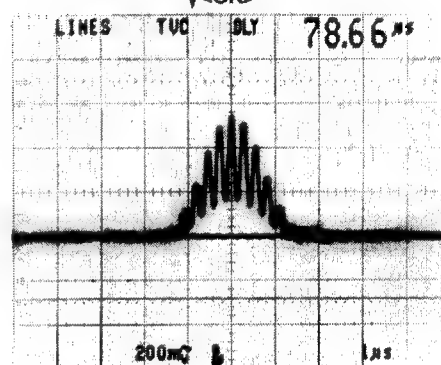
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

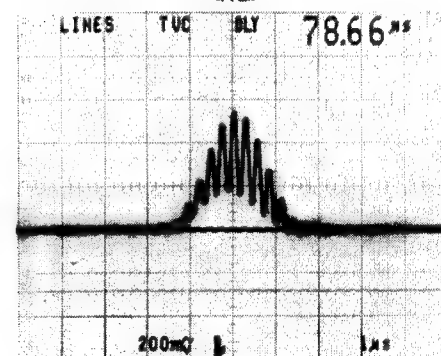


magnify

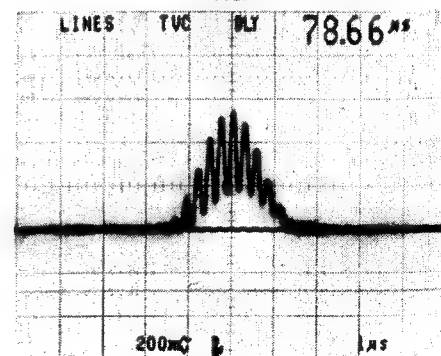
<OK>



<NG>



<NG>

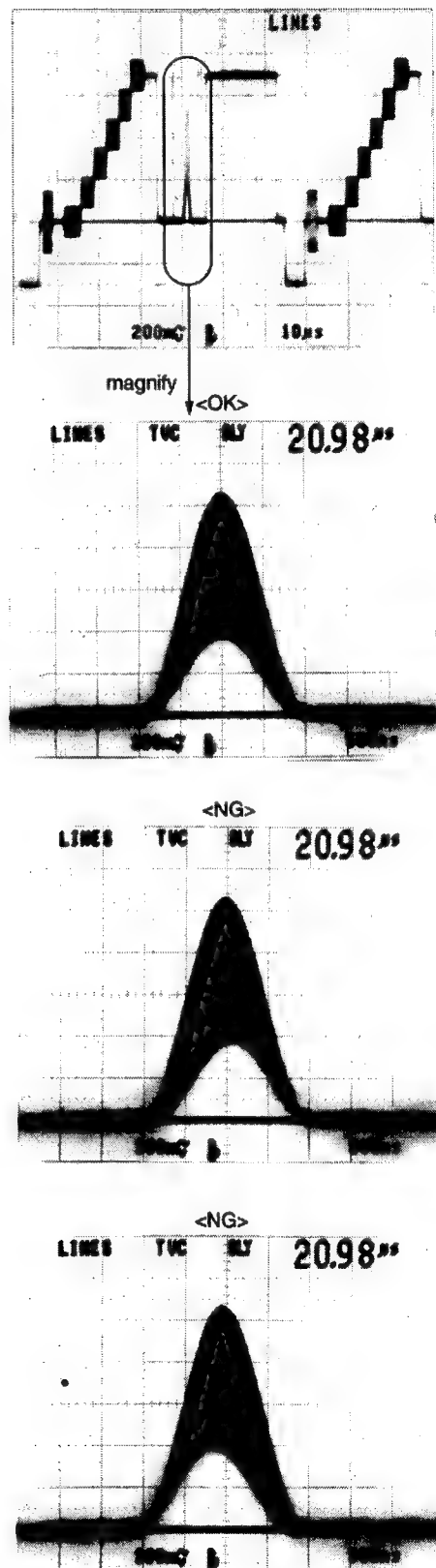


For DSR-500WSP

MENU No.: PGAE 9 B-Y DELAY
Measuring point: MONITOR OUT
VTR MODE: PB
Tape: Line 17 (R-Y off)/XH5-1AP
Specification: Adjust the envelope so that it is symmetrical on the left and right sides.

Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.



11-5-4. PB Y/R-Y Delay Adjustment

For DSR-500WS

MENU No.: PAGE 9 R-Y DELAY

Measuring point: MONITOR OUT

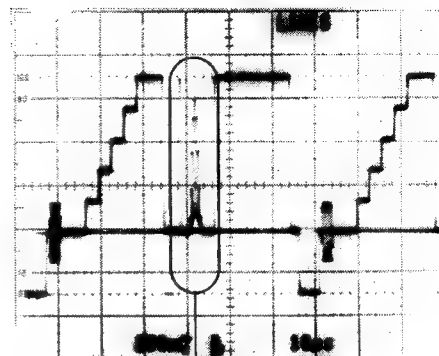
VTR MODE: PB

Tape: Line 17 (B-Y off)/XH5-1A

Specification: Adjust the envelope so that it is symmetrical on the left and right sides.

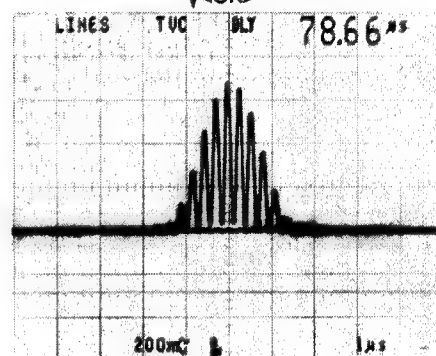
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

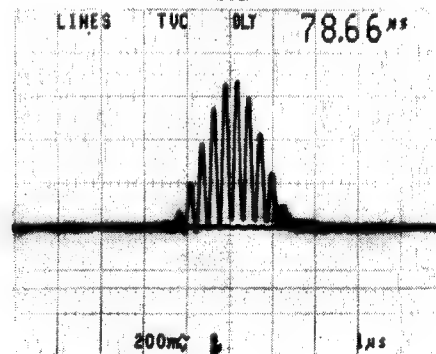


magnify

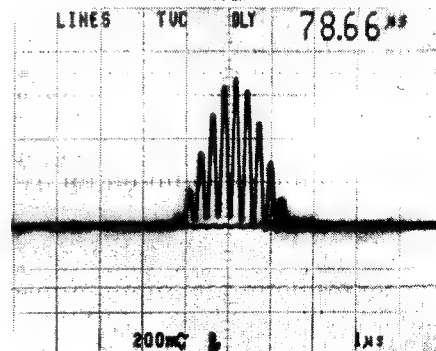
<OK>



<NG>



<NG>



For DSR-500WSP

MENU No.: PAGE 9 R-Y DELAY

Measuring point: MONITOR OUT

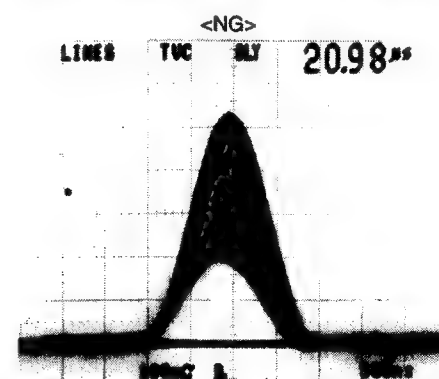
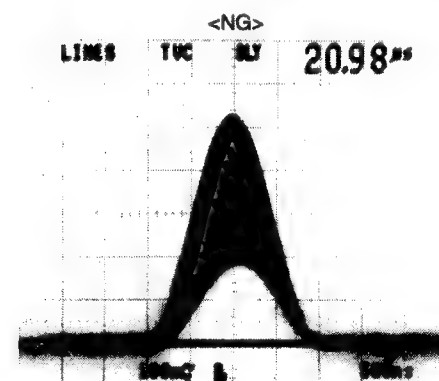
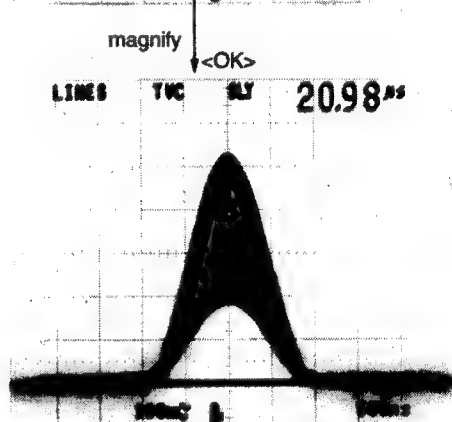
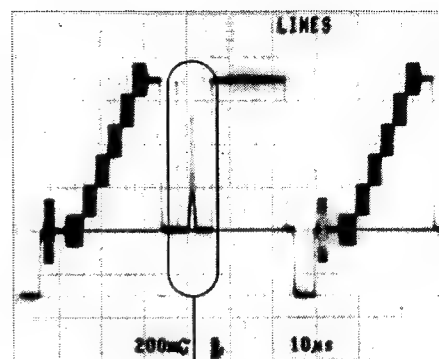
VTR MODE: PB

Tape: Line 17 (B-Y off)/XH5-1AP

Specification: Adjust the envelope so that it is symmetrical on the left and right sides.

Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.



11-5-5. PB R-Y Level Adjustment

MENU No.: PAGE 9 VTR R-Y

Measuring point: S-VIDEO (C) OUT

VTR MODE: PB

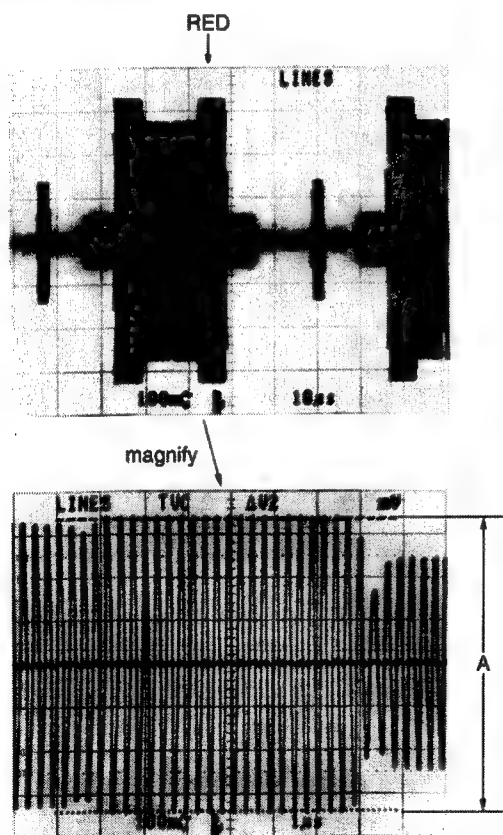
Tape: 75 % Full Color bars (B-Y off)/
XH5-1A
100 % Full Color bars (B-Y off)/
XH5-1AP

Specification: Chroma (red) level
DSR-500WS : $A = 659 \pm 5$ mV
DSR-500WSP : $A = 885 \pm 5$ mV

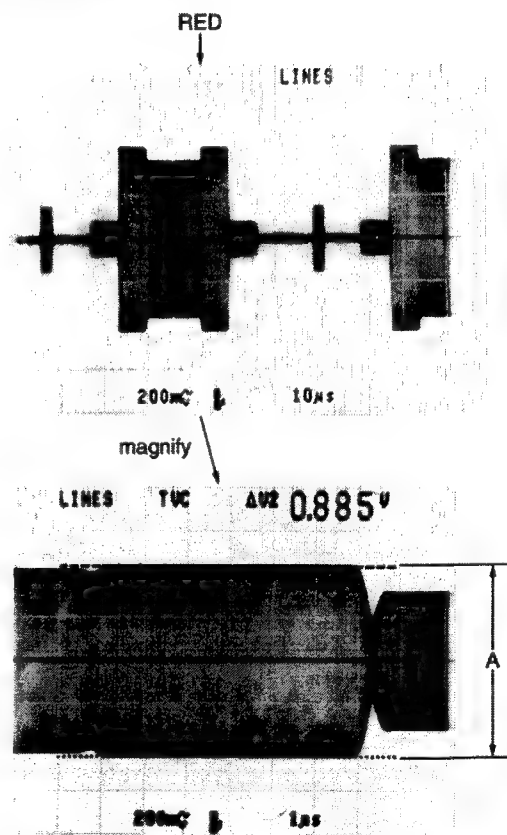
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



11-5-6. PB B-Y Level Adjustment

MENU No.: PAGE 9 VTR B-Y

Measuring point: S-VIDEO (C) OUT

VTR MODE: PB

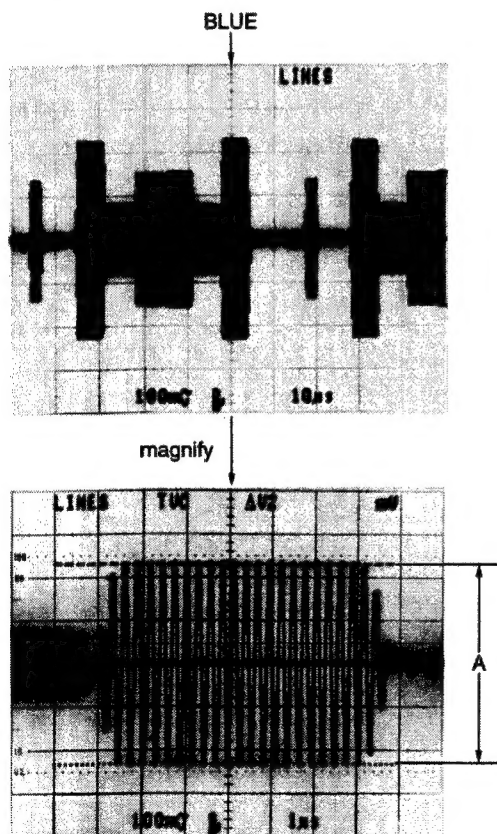
Tape: 75 % Full Color bars (R-Y off)/
XH5-1A
100 % Full Color bars (R-Y off)/
XH5-1AP

Specification: Chroma (blue) level
DSR-500WS : $A = 468 \pm 5 \text{ mV}$
DSR-500WSP : $A = 612 \pm 5 \text{ mV}$

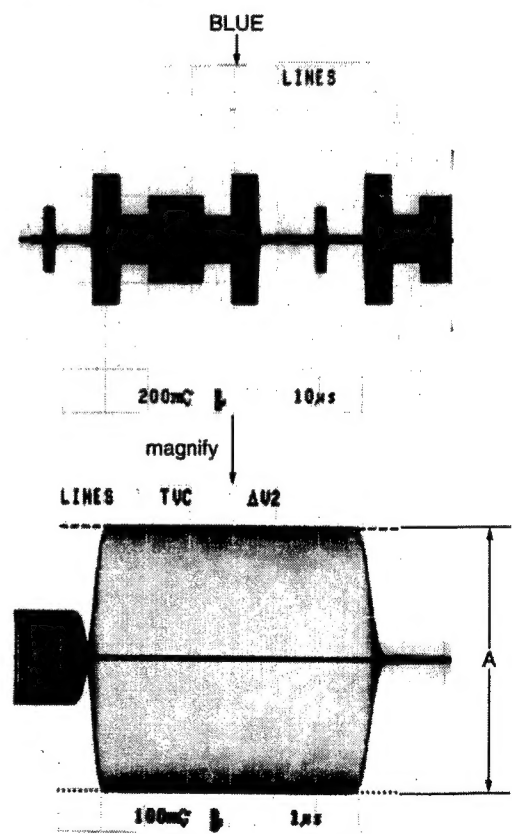
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



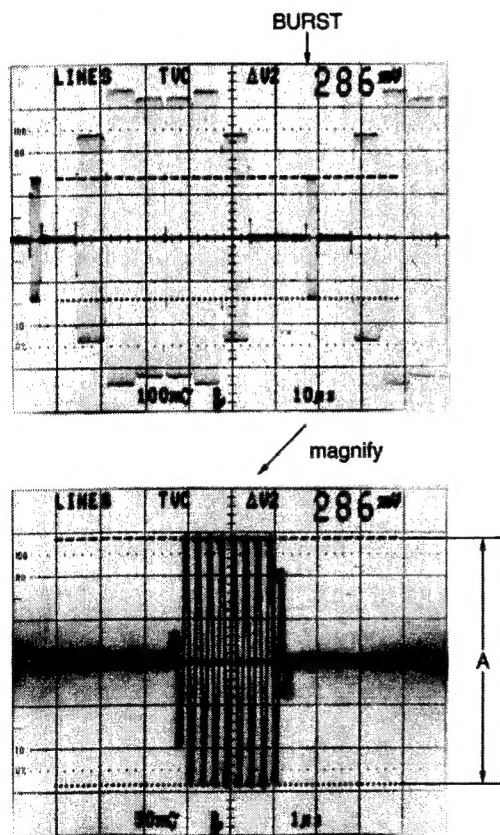
11-5-7. PB Burst Level Adjustment

MENU No.: PAGE 10 VTR BST
Measuring point: S-VIDEO (C) OUT
VTR MODE: PB
Tape: 75 % Full Color bars/XH5-1A
100 % Full Color bars/XH5-1AP
Specification: DSR-500WS : $A = 286 \pm 3 \text{ mV}$
DSR-500WSP : $A = 300 \pm 3 \text{ mV}$

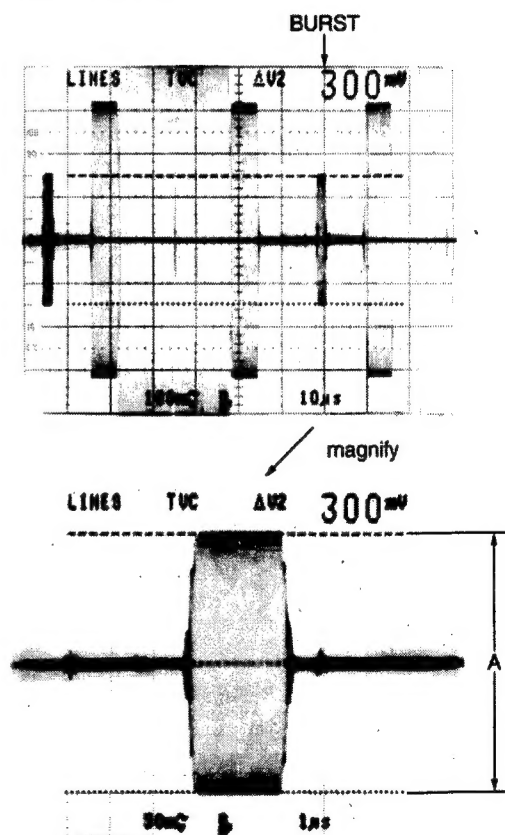
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



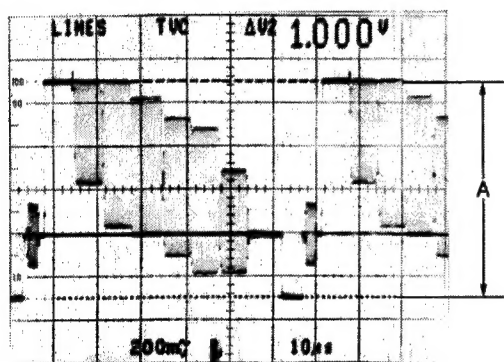
11-5-8. PB VBS Y Level Adjustment

MENU No.: PAGE 10 PB VBS
Measuring point: MONITOR OUT
VTR MODE: PB
Tape: 75 % Full Color bars/XH5-1A
100 % Full Color bars/XH5-1AP
Specification: $A = 1.00 \pm 0.01$ V

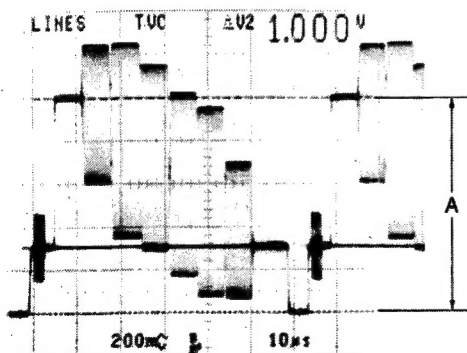
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



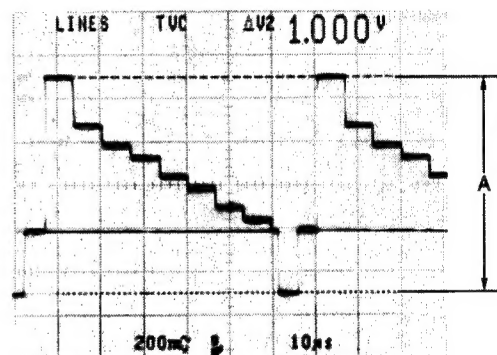
11-5-9. EE Y Level Adjustment

Input signal: Internal Color bars
MENU No.: PAGE 10 EE S-Y
Measuring point: S-VIDEO (Y) OUT
VTR MODE: EE
Tape: Not required.
Tape: $A = 1.00 \pm 0.01$ V

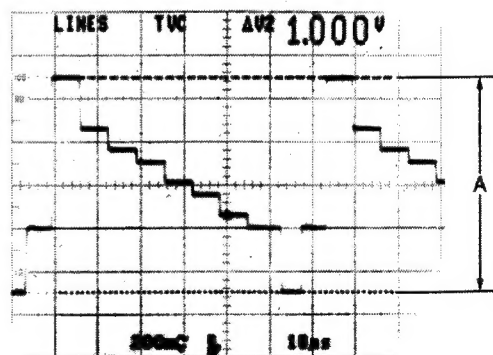
Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP



11-5-10. EE Chroma Level Adjustment

Input signal: Internal color bars

MENU No.: PAGE 10 EE S-C

Measuring point: S-VIDEO (C) OUT

VTR MODE: EE

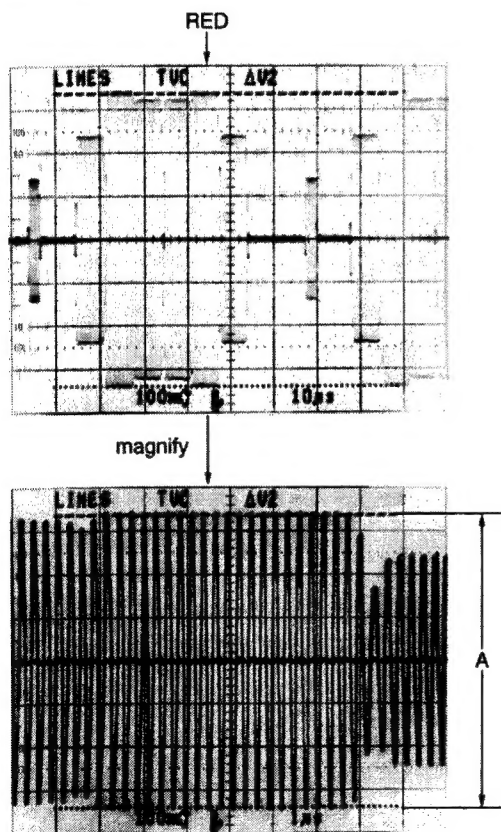
Tape: Not required.

Specification: DSR-500WS : $A = 627 \pm 5$ mVp-p
DSR-500WSP : $A = 664 \pm 5$ mVp-p

Adjustment Procedure

Perform adjustment by turning the MENU dial, and store the data by pushing the MENU dial.

For DSR-500WS



For DSR-500WSP

